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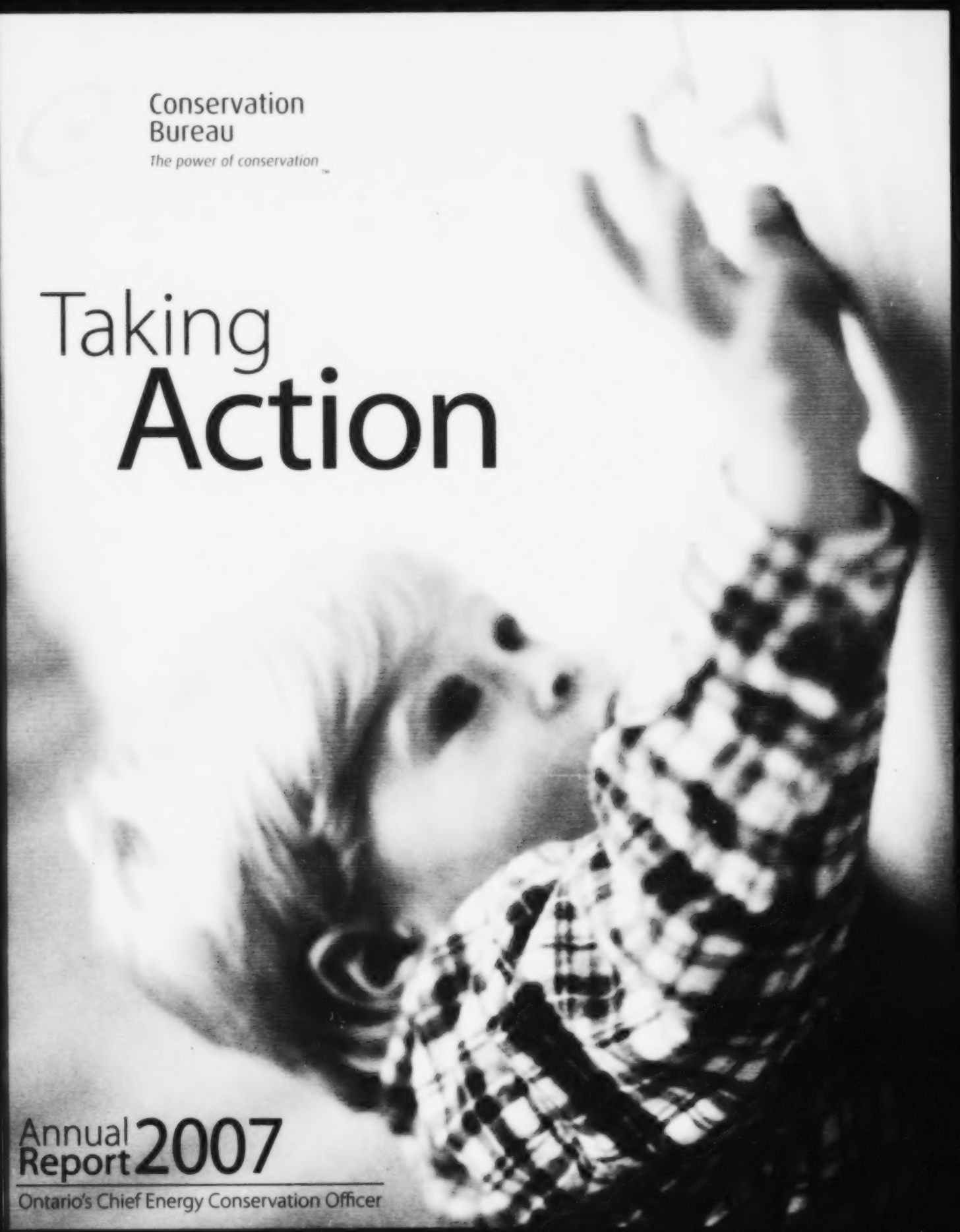
Taking Action



Annual Report 2007

Ontario's Chief Energy Conservation Officer

RECOMMENDED ACTIONS

1. The Ministry of Energy should develop a comprehensive and cohesive energy conservation policy for all government departments that aligns the province's electricity policies with other related policies. All government departments should be required to consider this policy in their decision-making processes, and prescribed government ministries should be required to include a commitment to energy conservation in their Statement of Environmental Values.

2. The government should reconfigure the role of the Chief Energy Conservation Officer to include advocacy for conservation of other important forms of energy used in Ontario, including natural gas and transportation fuels.

3. The Ministry of Municipal Affairs and Housing should prepare a plan for the orderly consideration of energy efficiency in all renovations and retrofits.

4. The Ministry of Energy should raise the minimum energy performance standards for the six consumer products currently exempt from provincial retail sales tax (refrigerators, freezers, dishwashers, clothes washers, dehumidifiers and air conditioners) to the highest levels in North America.

5. The government should evaluate options to assist households defined as low-income to deal with economic burdens associated with upgrading to energy-efficient products affected by new codes and standards.

6. The Ministry of Energy should issue regulations under the *Energy Conservation Leadership Act* requiring public agencies to prepare annual energy conservation plans with a high priority on implementing energy conservation measures in their daily operations and capital projects.

7. The Ministry of Energy should issue regulations under the *Energy Conservation Leadership Act* to designate combined heat and power projects, clotheslines and solar collectors so that they may be used where there are restrictions, such as municipal zoning by-laws, that would otherwise prevent or impede their use.

8. The Ministry of Energy and the Ministry of Municipal Affairs and Housing should collaborate with the federal government and other provinces to introduce voluntary labelling of the energy performance of all new and resale buildings coincident with the current Ontario Building Code review cycle, with the intent of issuing a regulation to require labels for all new and resale buildings.

9. Ontario's municipalities should appoint Municipal Energy Conservation Officers to engage communities at the local level in creating a culture of conservation throughout the province.

10. All government procurement policies and contracts should include current ENERGY STAR® requirements for energy efficiency where available.

11. The government should ensure that future changes to the way electricity bills are presented to consumers provide enough information and transparency to enable them to make better decisions about electricity use.

12. The government should work with the appropriate players in the electricity sector to coordinate research and develop educational programs and tools needed to enable customers to learn about and benefit from the use of technologies such as smart meters.

See Chapter 6 for findings and explanations for the recommended actions.

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a division of the Ontario Power Authority

November 1, 2007

Minister of Energy
900 Bay Street, 4th Floor
Toronto, ON M7A 2E1

John Beck
Chair, Board of Directors
Ontario Power Authority
120 Adelaide Street West, Ste. 1600
Toronto, ON M5H 1T1

Dear Minister and Board members:

In accordance with the requirements under *The Electricity Act, 1998*, amended in 2004, I am pleased to present the 2007 annual report of the Chief Energy Conservation Officer.

As required under the Act, this report includes:

- a review of the Ontario government's progress in meeting its conservation and demand management targets (chapter 3)
- steps taken to implement the current year's proposals and information on the results achieved (chapter 4)
- the Ontario Power Authority's proposals for the following year for initiatives to (chapter 5):
  - promote electricity conservation and load management
  - procure reductions in demand and promote demand management
  - facilitate the provision of services relating to conservation and load management
- findings and recommendations on government policy and legislation that result in a barrier to the implementation of electricity conservation measures (chapter 6).

The report also includes information on the conservation programs of other market players in the public and private sectors (chapter 3) and a summary of the government's actions taken in response to the recommendations made in last year's annual report (chapter 7). The many actions being taken in support of Ontario's culture of conservation are described throughout the report.

Sincerely,

Peter Love
Chief Energy Conservation Officer

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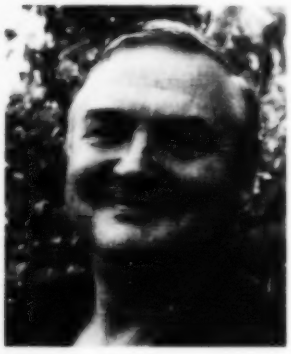
A Message from the Chief Energy Conservation Officer

Think. Believe. Act.

This year, people in Ontario who are dedicated to the cause of electricity conservation have reason to be proud. For the first time ever, our province has an Integrated Power System Plan that recognizes the critical role of conservation in the future of Ontario's electricity system. The plan includes a target of 6,300 megawatts of electricity conservation by 2025, which is the equivalent of powering five homes with the amount of electricity currently used to power four. I am excited that Ontario is positioned to be at the forefront of electricity leadership — both in terms of supply and demand management.



Since the creation of the office of the Chief Energy Conservation Officer three years ago, Ontarians have begun to embrace the need to conserve electricity. There are many signs that a change in the mindsets of consumers is underway. Eighty percent of Ontario households indicate that they have installed at least one compact fluorescent light (CFL) bulb in their homes, meaning that four out of every five homes have taken at least some action toward electricity conservation. In 2004, only one out of five homes was taking advantage of this energy-saving technology. Positive indicators such as these have convinced me that Ontario has made a great start toward building a conservation culture, but it is time to move beyond the CFL bulb.

The consistent efforts of the Ontario Power Authority, delivery partners and independent organizations have introduced Ontario electricity consumers to an array of products, services and information that support conservation. In May 2007, I reported that conservation activities had reduced the province's peak electricity demand by 1,080 megawatts. Again, this is a great start, but we are still a very long way from 6,300 megawatts. I have made 12 recommendations for action in this report that identify barriers to and opportunities for conservation that will help move Ontario closer to a culture of conservation.

The Ontario Power Authority is pursuing a three-pronged strategy to create a culture of conservation and achieve this ambitious 6,300 megawatt goal — 1) building capability for conservation, 2) acquiring resources necessary to encourage action, and 3) eventually transforming the market so that conservation simply becomes the norm.

Taking Action

This means that in every decision we make — whether to buy, build or move — we consider the use of electricity. To this end, I have begun to elaborate on what a "culture of conservation" means — to think about, believe in and act on electricity conservation when we make decisions.

Unlike the water we use, electricity is invisible. I am asking Ontarians to use less of and take action on something that they can't see or feel. This hidden nature of electricity makes it so important to celebrate conservation success and to recognize leaders in conservation. We want to understand what motivates them to act, so we can encourage others to act as well.

The good news is that most Ontarians have begun to think about electricity conservation. To foster and maintain a culture of conservation, the people of Ontario must believe that responsible and efficient use of electricity is critical, and finally, they must be convinced to act on this belief.

Today, a combination of public education and incentives are motivating people to embrace the cause of conservation. The Ontario Power Authority is also investing in the training, technology and methods to measure results that will build our capability to deliver and verify effective conservation. Tomorrow, conservation should be as natural as recycling.

Until conservation is engrained in our daily lives, we must take action. For most of us, thinking, believing and acting with the province's electricity conservation goals in mind will take some effort. It will force us to be aware of things that we didn't consider before. In my 2005 annual report, entitled "Our Conservation Challenge," I challenged everyone in Ontario to reduce his or her electricity consumption and adopt a culture of conservation. In my 2006 report, entitled "A New Era in Electricity Conservation," I summarized the progress that had been made to date. The focus of this report is on "Taking Action," because, as much as Ontarians have accomplished, we have so much more to do together.

The signs of an emerging culture of conservation are all around us. It is up to all of us, as individuals, employees, businesses and communities, to move our homes, workplaces and community institutions into this culture. We *all* can be leaders in conservation.

Peter Love
Chief Energy Conservation Officer
November 2007

CHAPTER 1

INTRODUCTION

Ontario's conservation goals are among the most ambitious in North America. In the long term, these goals include creating a culture of conservation and reducing peak demand by 6,300 megawatts by 2025. This is almost equal to the supply capacity of Ontario's current coal-fired generation plants, which will be replaced by the end of 2014. Short-term conservation goals include the reduction of Ontario's peak demand by 1,350 megawatts by the end of 2007 as well as a 10 percent reduction in the electricity consumption of Ontario government buildings.

The commitment and actions of all electricity consumers are critical to achieving the province's goals for conservation. To help reach these goals, the Chief Energy Conservation Officer issued a challenge to all Ontarians in 2005 to reduce their electricity consumption by 10 percent. Ontarians are being urged to **THINK** about electricity, **BELIEVE** they can make a difference and **ACT** with the province's conservation goals in mind when they use electricity at home, work or play.

THINK.

Electricity users must **THINK** about electricity as a limited resource. Electricity is a valuable form of energy because of the countless services it provides. It was once abundant and cheap. However, demand has increased because of population and economic growth. This means increased costs and environmental implications when electricity is generated, transmitted and used.

BELIEVE.

When consumers are aware of the need to conserve electricity, they must **BELIEVE** in the benefits of using less – that they should be, and can be, using less electricity. It is in everyone's best interests to reduce the need to generate electricity.

ACT.

The Chief Energy Conservation Officer is convinced that, once Ontarians believe in the need to conserve electricity, they will be moved to **ACT**. Many individuals, businesses and industries in Ontario have already invested in energy efficiency, changed when and how they use electricity, switched to other fuels and started to generate their own electricity. Everyone has the capacity to be a leader in electricity conservation.

THE 2007 ANNUAL REPORT

The Chief Energy Conservation Officer issues a report every year on conservation progress in Ontario. This is the third such annual report. It provides details on existing and upcoming conservation programs and activities, but the timing of this report means that an update on the current year's results is not yet available.

As a result, a supplementary report will be issued in the spring of 2008 that will report on the 2007 conservation results. This approach ensures timely reporting on measured results, as well as transparency and accountability for Ontario's conservation actions.

This report includes an update on progress toward the government's short-term conservation targets, as well as the Chief Energy Conservation Officer's challenge. It also describes the Ontario Power Authority's 2007 conservation programs and plans for the years 2008 to 2010 and the conservation activities of other market players. The report concludes with findings on government policy and legislation that have been identified as barriers to conservation and makes recommendations for overcoming them.

STRATEGIC APPROACH TO BUILDING A CONSERVATION MARKET

A functioning market for conservation products and services is beginning to develop in Ontario. In the early stages, intervention in the market can deal with shortcomings such as investment risk, consumer preferences or lack of supply chains and expertise. To ensure that Ontario's conservation targets are met cost-effectively and in a sustainable manner, the Ontario Power Authority has adopted a long-term, strategic approach to conservation that involves a mix of efforts:

- **Capability building** involves developing the skills and knowledge of market players needed to deliver effective conservation programs, as well as training and educating all consumers about the opportunities, needs and ways to conserve.

CONSUMPTION AND DEMAND

Conservation programs can affect both electricity consumption and demand. **Consumption** is the amount of electricity used over time and is expressed in kilowatt-hours. **Demand** is the total amount of electricity needed by the system at a given point in time and is expressed in mega-watts. It is also referred to as **load**. Ontario's electricity future depends on both overall consumption and demand being properly managed.

Ontario Power Authority Mission

To contribute to the development of a reliable and sustainable electricity system for the benefit of Ontario customers. In so doing, we encourage and facilitate conservation and electricity supply from diverse resources.

Conservation Strategic Objective

To contribute to the achievement of Ontario's conservation resource targets, and to foster a culture of conservation using a market-based approach.

- **Resource acquisition** refers to procuring peak demand and/or energy savings through tools such as payments to customers for demand management or shifting load, and customer incentives for energy-efficient products and buildings.
- **Market transformation** is a longer-term objective that refers to achieving a substantial and sustainable increase in the market share of energy-efficient technologies, buildings and production processes. Market transformation will have been achieved when a desired conservation practice or product dominates the market. Tools to bring about market transformation include policies, legal instruments and codes and standards that increase the energy efficiency of buildings, appliances and equipment. It also refers to behavioural changes that result from a culture of conservation.

All three strategies will be used in the short term, although the Ontario Power Authority anticipates that resource acquisition programs will make the most significant contribution to meeting the short-term targets. In the medium to long term, conservation goals are expected to be met through investment in capability building and market transformation, with a reduced need for resource acquisition programs.

Taking Action

THE INTEGRATED POWER SYSTEM PLAN — ONTARIO'S ELECTRICITY ACTION PLAN

The Integrated Power System Plan is a roadmap for achieving Ontario's electricity system goals. The plan was filed with the province's energy regulator, the Ontario Energy Board, in August 2007 and is expected to be approved in 2008.

An action plan with a 20-year outlook, it will be updated every three years, providing an opportunity to adapt to new knowledge, opportunities, challenges or emerging technologies. The plan outlines how the long-term conservation targets will be achieved by increasing activities in four main categories of consumer **ACTION**:

- reducing peak demand
- increasing energy efficiency
- fuel switching
- installing customer-based generation.

Reducing peak demand is encouraged through demand management and other programs aimed at influencing conservation behaviour, collectively referred to as demand management/ conservation behaviour.

Demand management refers to reducing electricity demand during peak hours or shifting electricity use to off-peak hours. It occurs when residential consumers shift use of their dishwashers and laundry appliances to later at night or when industrial consumers voluntarily agree to shut down equipment or scale back processes in response to a request or automatic signal.

Conservation behaviour includes voluntary actions to reduce electricity consumption. Raising the thermostat set point temperature a little higher in the summer to reduce air conditioner use, or turning off lights, computers and entertainment systems when not needed are examples of conservation behaviour.

Energy efficiency includes actions that reduce electricity consumption while retaining the same or similar level of service. It occurs when consumers replace household electric appliances and air conditioners with models that use less electricity or when industries change processes or upgrade equipment.

Fuel switching occurs when consumers choose energy sources more appropriate than electricity. Examples are replacing electric baseboard heaters with a natural gas furnace or using solar hot water heaters to supplement electric heat.

Customer-based generation is the installation of small-scale electricity or combined heat and power facilities near customers' load to meet all or a portion of their electricity needs. Small-scale renewable energy projects (500 kilowatts and less) and combined heat and power projects (10 megawatts and less) are included in meeting Ontario's conservation targets. Electricity generated under the province's net metering program is also included.[1]

ONTARIO'S LONG-TERM CONSERVATION TARGETS TO 2025

The Integrated Power System Plan describes how the medium- and long-term provincial energy conservation targets will be achieved according to the four types of consumer action. The plan includes detailed conservation programs up to 2010. It is less specific for the 2010 to 2025 period, as the plan's three-year cycle will allow for flexibility on individual programs to adapt to new knowledge and experience. The plan's proposed $60 billion budget allocates $10.2 billion to conservation, more than $500 million per year.

In addition to the 2007 target to reduce peak demand by 1,350 megawatts, the Ontario government has set mid- and long-term conservation targets. These include another peak demand reduction of 1,350 megawatts by 2010 and a further reduction of 3,600 megawatts by 2025, for a total peak demand reduction of 6,300 megawatts. Table 1.1 summarizes how these targets will be achieved. Detailed information is available in the Ontario Power Authority's Integrated Power System Plan.[2]

Table 1.1 – Proposed Peak Demand Savings from Conservation Activities from 2010 to 2025

Proposed Peak Demand Savings (megawatts)	2010	2015	2010	2025
Demand management/ conservation behaviour	566	769	925	1,004
Energy efficiency	623	1,938	2,694	3,189
Fuel switching	70	156	215	268
Customer-based generation	148	188	377	544
Total Proposed Peak Demand Savings	**1,410**	**3,050**	**4,210**	**5,000**

Source: Ontario Power Authority

Note: Totals have been rounded to the nearest 10 megawatts.

CHAPTER 2

CONSERVATION LEADERSHIP

The Chief Energy Conservation Officer provides public leadership on electricity conservation in Ontario. To encourage and motivate Ontarians to **THINK**, **BELIEVE** and **ACT** in ways that promote a culture of conservation, the Chief Energy Conservation Officer engages in many activities that raise awareness, educate, foster local leadership and publicly recognize those who are already taking action to conserve electricity.

There is no single way to change the behaviour of individuals, businesses and industries. However, there is increasing awareness that traditional top-down information and incentive programs are not sufficient. A variety of tools is needed to identify and remove barriers to conservation as well as to stimulate action. Raising awareness is a first step in this process. This is particularly important since electricity use and conservation are by nature "invisible" — and we tend to overlook things we cannot see or feel.

THE CHIEF ENERGY CONSERVATION OFFICER'S LEADERSHIP ACTIVITIES

Throughout 2007, the Chief Energy Conservation Officer met with community leaders across Ontario to promote a culture of conservation. Meetings involved representatives from industry, business, First Nations communities, the low-income sector and students at all levels. Awareness-raising activities included public speaking engagements, presenting Certificates of Recognition[1] to leaders actively engaged in conservation, as well as attending conservation program launch events and co-hosting a radio program.

During the first eight months of 2007, the Chief Energy Conservation Officer presented 36 Certificates of Recognition and made 144 public appearances. Table 2.1 summarizes the number of certificates presented and public appearances made from 2005 to August 31, 2007.

More information on the Chief Energy Conservation Officer's public appearances and Certificates of Recognition, including the nomination process, is available on the Conservation Bureau's website at www.conservationbureau.on.ca.

Media appearances and marketing campaigns help raise awareness with a wide spectrum of Ontarians and encourage conservation action that can have long-lasting impacts. The Chief Energy Conservation Officer uses a variety of media outlets to promote the long-term goal of building a culture of conservation. Specific media initiatives include:

- "Think, Believe, Act," a short video that highlights the challenges and opportunities for electricity conservation in Ontario and demonstrates the importance of taking conservation action now.

- "Save the Kilowatt," a summer radio campaign that delivered a series of four messages about conservation actions consumers can take when electricity demand peaks on hot summer days.
- "Power Lines," a monthly radio show on CFRB 1010, in which the Chief Energy Conservation Officer and co-host Christina Cherneskey discussed energy conservation issues and actions with a variety of guests, including well-known environmentalist Dr. David Suzuki.

These efforts, together with other radio and television appearances and advertising, contributions to newspapers and participation in panel discussions, resulted in approximately 49 million earned media impressions and 289 million paid media impressions in the first six months of 2007 for the Chief Energy Conservation Officer and the Ontario Power Authority's conservation programs.[4] The total number of impressions in 2006 was approximately 360 million.

CONSERVATION AWARENESS AMONG ONTARIO CONSUMERS

In 2007, the Ontario Power Authority commissioned province-wide market research among adults to understand consumer behaviour and attitudes toward electricity conservation. The research revealed that Ontarians are starting to recognize the importance of electricity conservation and are showing concern about the province's ability to meet long-term electricity demand. At the same time, many consumers still do not sense enough urgency to change their own behaviour significantly. Many have taken small steps to conserve electricity, such as turning off the lights or power to electronic devices when leaving a room. About eight in 10 Ontarians say they have replaced an incandescent light bulb with a more efficient compact fluorescent bulb.[5]

Table 2.1 – Certificates of Recognition and Public Appearances from 2005 to 2007

Activity	2005	2006	January to August 31, 2007
Certificates of Recognition	81	28	36
Public appearances	100	152	144

Source: Conservation Bureau

Leaders in Action Forum

In June 2007, the Ontario Power Authority sponsored the Leaders in Action Forum to bring business and other community leaders together to gain a shared understanding of the conservation challenge and the best ways to meet it. The forum encouraged Ontario businesses to show leadership in their own companies by making the bottom-line benefits of conservation a business priority. The link between corporate success and being a conservation leader was highlighted, as was how to unlock the tremendous conservation potential in Ontario's businesses.

Participants explored the ways municipalities in the Greater Toronto Area are tackling the energy challenge and learned how Ontario's business leaders are factoring conservation into their planning. In addition, legal, academic and logistical perspectives on conservation as it relates to business were discussed, as were insights and best practices on policy changes, measurement and return-on-investment issues.

At this forum, the Chief Energy Conservation Officer advised that a new award program is being developed to profile business leaders who implement electricity conservation successfully as part of their organization's business model. This province-wide program will recognize those with industry-leading energy-efficiency practices in all sectors. Details will be posted on the www.powerauthority.on.ca website when they are available.

ONTARIO'S ELECTRICITY SYSTEM AND CLIMATE CHANGE

There are obvious benefits to the environment from reducing the amount of electricity we use; one benefit is reduced greenhouse gas emissions that contribute to climate change. In Canada, 82 percent of man-made greenhouse gas emissions come from the production and use of energy. Of that total, 13 percent come from the production of electricity in Ontario. The Ontario Power Authority expects power plant emissions to drop from 25 megatonnes in 2006[6] to seven megatonnes in 2014 when the last of the coal-fired plants is retired.[7] The other critical tool for meeting the reduction targets is increased renewable electricity generation. The targets announced in June 2007 in the government's climate change plan are to reduce greenhouse gas emissions in absolute terms to six percent below 1990 levels by 2014, to 15 percent below 1990 levels by 2020, and to 80 percent below 1990 levels by 2050.

Market research helps the Ontario Power Authority gain a better understanding of what motivates consumers to practice electricity conservation. Research has shown that about one-third of the Ontario public is strictly budget-driven, another third is comfort-oriented and about a quarter is motivated to act based on concern for environmental issues. A small percentage of the public, about 12 percent, remain uninterested in electricity conservation and do not believe that individual actions can make a collective difference.[8]

A similar study was conducted among teens to understand how their behaviour and attitudes differed from those of adults. The primary motivation for reducing electricity use among young people was a desire to fight climate change and contribute to a better future.[9]

THE CHIEF ENERGY CONSERVATION OFFICER'S PROPOSED LEADERSHIP ACTIVITIES IN 2008

The Chief Energy Conservation Officer will continue to play a key role in fostering public awareness of the issues facing the electricity sector and emphasizing what consumers can do to conserve in 2008. **THINK, BELIEVE, ACT** will remain the overarching theme for the coming year. In support of this, the Chief Energy Conservation Officer will continue to champion conservation efforts across Ontario.

CHAPTER 3

CONSERVATION PERFORMANCE IN ONTARIO

Ontario has made significant progress in reducing energy consumption and peak electricity demand. The Chief Energy Conservation Officer issued a challenge in his 2005 annual report for Ontarians to reduce their overall consumption of electricity by 10 percent. The Ontario government set several targets related to reducing peak demand, reducing energy use in their own facilities and installing smart meters. These targets are to:

- reduce peak electricity demand by 1,350 megawatts by 2007
- reduce electricity consumption by the Ontario government in its own facilities by 10 percent
- install 800,000 smart meters in Ontario homes and small businesses by 2007.

This chapter reports on progress being made toward these targets and provides an update on the conservation programs of market players, including local distribution companies and others. Clearly, Ontarians are beginning to take **ACTION.**

PROGRESS TOWARD MEETING THE 10 PERCENT CHALLENGE TO REDUCE ELECTRICITY CONSUMPTION

In 2005, the Chief Energy Conservation Officer challenged the people of Ontario to reduce their energy consumption by 10 percent. In 2006, the weather-adjusted per capita consumption had decreased by 2.5 percent. The results for the first six months of 2007 show that further progress has been made toward achieving the 10 percent target.

Table 3.1 compares the actual and weather-adjusted electricity consumption data for the first six months of 2005 to the same time period in 2007. Since 2005, Ontario reduced its total electricity consumption by 3.3 percent after adjusting for weather. Ontarians reduced their per capita electricity consumption by 5.2 percent, which shows improvement over last year's results. These results reflect activity to June 2007, so efforts made during the remainder of the year are likely to increase this number even further.

PROGRESS TOWARD MEETING THE 2007 PROVINCIAL DEMAND REDUCTION TARGET

The 2007 target for peak demand reduction was initially cast as a five percent reduction compared to the Independent Electricity System Operator's weather-adjusted demand forecast made in 2003.[10] The Chief Energy Conservation Officer interpreted this in 2005 as 1,350 megawatts. Since the target was set, the method used to weather-normalize demand forecasts has changed. However, the 2007 target has been reaffirmed as a 1,350 megawatt reduction in peak demand.[11] In May 2007, the Chief Energy Conservation Officer reported that 1,080 megawatts of peak demand reduction had been achieved, based on a bottom-up analysis of two years of conservation programs and activities.

WEATHER NORMALIZATION

Forecasters use weather normalization or correction techniques to remove the impacts of variations in Ontario's weather patterns (either extremely warm or extremely cold summers) from observed peak load data. This is required because weather variations can cause the peak demand to swing up or down by up to 10 percent relative to the average weather peak demand for any particular day. Normalization enables analysts to compare a series of actual peak readings over a number of years on an "apples-to-apples" basis and use this data to determine how accurate their underlying forecast of demand was over a five- to 10-year period.[12]

The actual Ontario system peak in 2007 was 25,737 megawatts (24,820 megawatts weather-adjusted), on June 26, 2007. This peak is 1,268 megawatts lower than the highest peak demand in 2006 and represents a decrease of almost five percent.

Attributing electricity demand reductions in 2007 solely to the impact of conservation is not possible using a top-down approach. Peak electricity demand is influenced by several factors such as weather, economic activity and the coincidence between the two. A supplement to this report, expected in May 2008, will provide an analysis to confirm whether Ontario has met the 1,350 megawatt target for peak demand reduction.

Based on conservation activities so far this year, the Chief Energy Conservation Officer is confident that Ontario will meet the 2007 target.

PROGRESS TOWARD MEETING THE GOVERNMENT FACILITIES TARGET

The provincial government has reported that it has exceeded the target it established to reduce the electricity consumption in its own facilities by 10 percent by 2007. A 12 percent reduction has been reported, as shown in Table 3.2. This represents savings of more than 72 gigawatt-hours from the baseline years.

Numerous types of energy-saving projects contributed to the reduction in energy use, including lighting, air conditioning and other building retrofits; behavioural changes by government employees; and the commissioning

Table 3.1 – Ontario Electricity Consumption for January to June 2005 and 2007

Total from January to June	Actual Energy Consumption (gigawatt hours)	Actual Energy Consumption (kilowatt hours/capita)	Weather-adjusted Energy Consumption (gigawatt hours)	Weather-adjusted Energy Consumption (kilowatt hours/capita)
2005	79,096	6,298	78,364	6,240
2007	76,218	5,952	75,744	5,915
% Decrease	**3.6**	**5.5**	**3.3**	**5.2**

Source: Independent Electricity System Operator and Ontario Demographic Quarterly

Table 3.2 – Provincial Government Facilities' Performance Summary

	2002-2003 Baseline (gigawatt hours)	2006-2007 Consumption (gigawatt hours)	Reduction Achieved (gigawatt hours)	Percent Reduction (%)
Ontario Realty Corporation-operated	361.3	323.2	38.1	10.5
Ministry-operated	241.7	207.5	34.2	14.2
Total	**603**	**530.7**	**72.3**	**12**

Source: Electricity Reduction Summary to March 31, 2007, from Erwin Massiah, Ontario Realty Corporation

Note: 2002-2003 base data received in 2007 are different from those received in 2006.

of deep lake water cooling for government buildings, where water is taken from Lake Ontario to cool office buildings instead of traditional air conditioning.

During 2007, continuous improvement of the tracking database of government facilities, transfers of buildings out of government use, as well as better estimates of the consumption in several ministry-operated buildings, resulted in an adjustment to the 2002/2003 baseline from last year's estimate of 644 gigawatt-hours to 603 gigawatt-hours.

PROGRESS TOWARD MEETING THE 800,000 SMART METER TARGET

The government set targets for the installation of 800,000 smart electricity meters on homes and small businesses by the end of 2007 and throughout Ontario by December 31, 2010.

The Independent Electricity System Operator is preparing to manage centralized meter data and act as a smart meter data repository. This will provide a common infrastructure for receiving and storing meter reading data from all smart meters in Ontario.

Local distribution companies are responsible for installing, reading and maintaining the smart meters. Thirteen local distribution companies have already exceeded the 2007 installation target of 800,000 meters and are on track to install more than one million smart meters in Ontario by the end of 2007. Table 3.3 shows the number of smart meters that each of these companies had installed as of September 2007, as well as their targets for new installations for the remainder of the year.

CONSERVATION PROGRAMS OF OTHER MARKET PLAYERS

The Ontario Power Authority is delivering many conservation programs in 2007 in all sectors, which are described in Chapter 4.

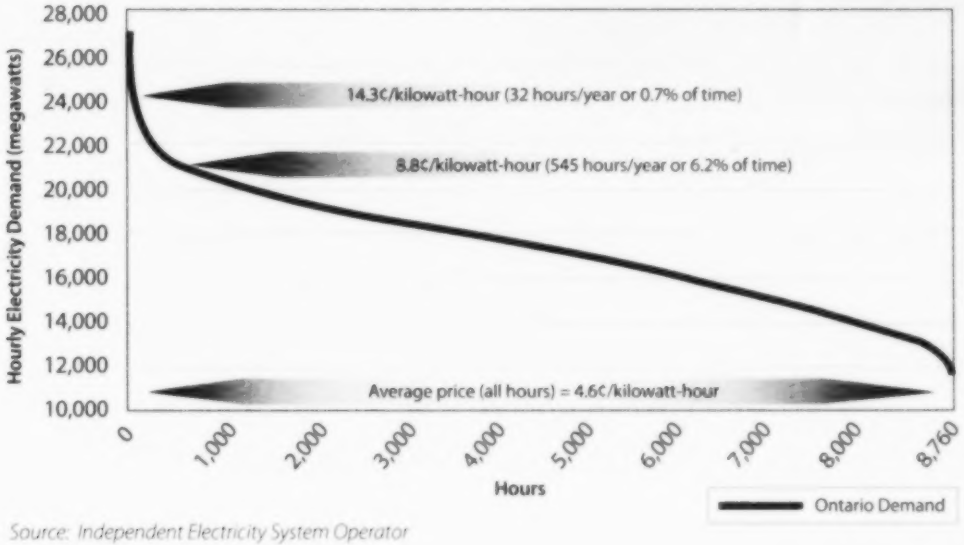
Many market players in addition to the Ontario Power Authority are delivering programs to inspire all Ontarians to take **ACTION** to achieve the province's conservation goals. These players

Table 3.3 – Residential Installed Interval Smart Meters as of September 2007

Local Distribution Company	Installed Meters	2007 "Phase 1" Target
Toronto Hydro	300,000	360,000
Hydro One/Brampton Hydro	170,000	240,000
Hydro Ottawa	145,947	120,000
PowerStream	54,708	80,000
Enersource	43,550	60,000
Chatham-Kent/Middlesex Hydro	30,600	32,081
Newmarket/Tay Hydro	23,254	23,575
Horizon	16,904	50,000
Veridian	16,611	40,000
Milton Hydro	6,000	14,341
TOTAL	**807,574**	**1,019,997**

Source: Ministry of Energy

LOAD DURATION CURVE (2006 DATA)



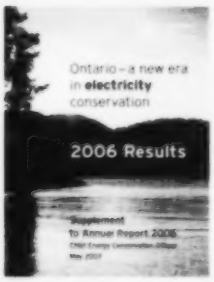
Source: Independent Electricity System Operator

Traditional electricity meters only measure the total amount of electricity used over the entire billing period. Interval or "smart" meters measure **when** electricity is used in addition to how much is used. This is critical for consumers to understand their electricity consumption because at certain times the cost of electricity is extremely high.

This graph is called a load duration curve. It displays the demand placed on Ontario's electricity system for every hour of the year. For example, the curve indicates that system demand was more than 21,000 megawatts for about 550 hours of 2006, or 6.2 percent of the year. The price of electricity rises dramatically at these peak times. The average cost of electricity in 2006 was 4.6 cents per kilowatt-hour, but for 32 peak hours, the cost of producing electricity was more than three times the average.

With time-of-use pricing, the price of electricity will vary based on **when** it is used. Smart meters will enable Ontarians to take advantage of time-of-use prices and shift their electricity use to off-peak times. This will decrease strain on the system during peak times and reduce the need for expensive peaking plants and electricity imports. Time-of-use rates effective Nov. 1, 2007, set by the Ontario Energy Board are 8.7 cents per kilowatt-hour for peak times, 7.0 cents per kilowatt-hour for mid-peak, and 3.0 cents per kilowatt-hour for off-peak times.[13]

ONTARIO CONSERVES IN 2006



In May 2007, the Chief Energy Conservation Officer issued a supplement to his 2006 Annual Report that summarized the results of the 2006 conservation programs and activities of the Ontario Power Authority and local distribution companies. The supplement included a "bottom-up" analysis of progress by all major players toward meeting the province's peak-demand reduction target and provided further evidence of a new era of conservation in Ontario. Electricity consumers reduced peak demand by approximately 1,080 megawatts to the end of 2006, including 350 megawatts of naturally occurring conservation. The supplement is available on the Conservation Bureau website at www.conservationbureau.on.ca.

include the provincial and federal governments, local electricity distribution companies, community groups and natural gas utilities.

• PROVINCIAL GOVERNMENT PROGRAMS

Governments play a fundamental role in the advancement of energy efficiency and electricity conservation. Although the Ontario Power Authority is the lead agency mandated by the Ontario government to coordinate energy efficiency and peak load reduction, the provincial government also implements a number of in-house programs and some external programs independently. The in-house programs are designed to achieve the provincial government's internal 10 percent consumption reduction target and were successful in achieving a 12 percent reduction between fiscal year 2002-2003 and fiscal year 2006-2007 (see pages 13-14).

The following Ontario government programs operated in 2007:

Provincial Government Internal Initiatives:

- Building Retrofits and Upgrades: Ontario Realty Corporation Buildings and Ministry Buildings
- Ontario Realty Corporation Special Initiative: Deep Lake Water Cooling
- Ontario Realty Corporation Special Initiative: Jail and Youth Detention Centres
- Ontario Realty Corporation Special Initiative: Cogeneration Sites
- Ontario Realty Corporation Special Initiatives: Retro-commissioning/Continuous Commissioning

Taking Action

Provincial Government External Initiatives:

In addition to in-house programs, the provincial government provides rebates to encourage homeowners to purchase more energy-efficient appliances through the retail sales tax rebate for ENERGY STAR® products. Rebates are also available to homeowners who retrofit their homes to become more energy efficient through the Ontario Home Energy Retrofit Program. Other initiatives encourage Ontarians to switch to non-electric sources of energy and increase the efficiency of refrigerants. Below is list of the additional existing programs and those under development in 2007:

- Retail Sales Tax Rebate
- Solar Incentives
- Purchasing Green Power
- Financing for Residential Renewable Energy
- Power House zero-interest loan
- Ontario's Refrigerants Regulation[14]

Further information about provincial and federal government programs can be found on the government websites as well as in a report entitled *Overview and Analysis of Ontario Provincial and Federal Electricity Conservation and Efficiency Initiatives* by Marbek Resource Consultants Ltd., available on the Conservation Bureau's website, www.conservationbureau.on.ca.

• FEDERAL GOVERNMENT PROGRAMS

At the federal level, Natural Resources Canada is the lead agency in delivering energy-efficiency programs. In addition to setting overall energy policy, the department spends approximately $180 million per year on energy-efficiency programs of various types.[15] Programs span all sectors, including residential, commercial and industrial, and use a variety of incentives and educational elements to drive efficiencies and conservation throughout the country. Beginning in 2007, Natural Resources Canada's Office of Energy Efficiency programs were re-branded and now fall under the ecoENERGY Efficiency Initiative portfolio of programs. The Office of Energy Efficiency delivers many conservation programs in Ontario.

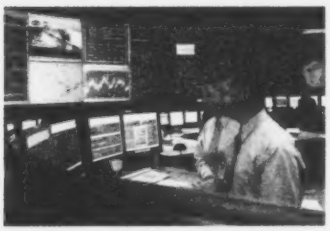
The following federal energy-efficiency programs operated in 2007:

- Commercial Building Incentive Program
- Industrial Building Incentive Program
- Canadian Industry Program for Energy Conservation
- R-2000 Standard Program
- EnerGuide for New Homes Program
- EnerGuide for Existing Homes
- ENERGY STAR Label Program
- Federation of Canadian Municipalities Green Municipal Fund

Ontario keeps power demand in check

Businesses scaled back electricity usage in response to request for conservation, energy operator says

The Globe and Mail, August 3, 2007



On the hottest day of the year, the province was able to avoid breaking records for power demand by responding to a request to conserve electricity from the agency that monitors the province's power system. The peak power use was 25,584 megawatts, short of the projected peak of 26,302 megawatts.

"We are seeing an increasing response from business and residents to the need to conserve and cut back during times when the power system is strained. The response to our August 2 appeal to curb or shift electricity use to off-peak hours during that extremely hot day contributed to our ability to maintain the overall reliability of the system."

— **Paul Murphy**, president and chief executive officer, Independent Electricity System Operator

• LOCAL ELECTRICITY DISTRIBUTION COMPANY CONSERVATION EFFORTS

Local electricity distribution companies are key players in promoting electricity conservation. They participate in two important ways: through the design and delivery of their own conservation programs approved by the Ontario Energy Board and through the delivery of programs designed by the Ontario Power Authority. A description of the local electricity distribution company conservation programs funded by the Ontario Power Authority is provided in Chapter 4.

The conservation programs delivered by local distribution companies include demand response initiatives, lighting retrofits, hot water tune-ups and water heater load control programs. The following are key results of some of the conservation programs delivered in the first six months of 2007 by local distribution companies serving close to 80 percent of Ontarians:[16]

- **25,500,000** kilowatt-hours saved annually based on conservation measures taken
- **228,012** compact fluorescent light bulbs distributed
- **26,321** electricity load control devices installed on residential appliances
- **13,191** inefficient air conditioners and appliances disposed of responsibly
- **7,250** electric hot water heaters wrapped or tuned up.

Additional Conservation Programs

The Ontario Energy Board approved local distribution company conservation expenditures of approximately $160 million, referred to as third tranche[17] expenditures, for the period from 2005 to the end of September 2007. These programs are in addition to the conservation programs that are delivered by the local distribution companies for the Ontario Power Authority.

The Board also approved approximately $3 million in incremental third tranche conservation funds to eight local distribution companies for the 2006 rate year ending April 2007. The funds were to be spent on programs covering residential, commercial and institutional sectors and include residential and commercial lighting rebates, coupon programs, hot water tune-ups and water heater load control programs.

In March 2007, the Board provided a process for local distribution companies to apply for additional funding to continue existing third tranche programs until the end of April 2008. The total incremental local distribution company funding currently approved through 2006 and 2007 electricity rates is more than $3 million. These additional expenditures on conservation assist local distribution companies in actively supporting the cultural shift to conserve electricity.

• ENERGY MANAGEMENT COMPANIES

Energy management companies deliver energy conservation projects in commercial, institutional and industrial operations. Based on data received from leading Ontario energy management company respondents to a survey by the Ontario Power Authority in 2006, more than $200 million in energy conservation measures was expended in 2005 and 2006, and peak demand reductions are estimated at more than 20 megawatts in each of those years.[18]

• CONSERVATION OUTREACH AND EDUCATION PROJECTS

The responsibility for promoting conservation is not limited to the government or the Ontario Power Authority. The role of other participants must be recognized, and different delivery channels for conservation, including non-profit organizations and universities, must be supported. Programs have included the Cool Shops Program managed by the Clean Air Foundation, and EcoSchools, coordinated by York University's Faculty of Environmental Studies. Another community-based program, Reduce the Juice, is a youth-led conservation campaign that raised community awareness of the importance of using electricity wisely. Organizations such as Project Porchlight and the Conservation Council of Ontario have introduced many people, businesses and associations to new products and services that have reduced the province's overall demand. These initiatives focus on particular target groups for their electricity conservation programs.

• NATURAL GAS DISTRIBUTORS

Ontario's two largest natural gas distributors, Enbridge Gas Distribution and Union Gas, run electricity conservation programs (referred to as demand-side management) for all sectors. Programs range from incentives for energy-saving systems to delivery and installation of energy-efficient products. Both companies have been designing and delivering conservation programs for more than a decade. While their conservation programs are targeted at reducing natural gas consumption, some also result in electricity savings.

Table 3.4 shows the expected electricity savings for both utilities in 2007. The Enbridge Gas Distribution values are based on the company's demand-side management plan as approved by the Ontario Energy Board. The values for Union Gas represent actual results the company has achieved as of June 2007, combined with estimated results for the balance of the year.

Table 3.4 – Union Gas and Enbridge Demand-side Management 2007 Expected Net Electricity Savings

Program Type	Electricity Savings (gigawatt-hours)	
	Enbridge Gas Distribution	Union Gas
Residential programs	2.2	1.3
Commercial programs	10.4	1.7
Industrial programs	4.6	2.0
Total	**17.2**	**4.9**

Note: Totals may not add due to rounding.

CHAPTER 4

THE ONTARIO POWER AUTHORITY'S 2007 CONSERVATION PROGRAMS AND ACTIVITIES

The Ontario Power Authority is championing Ontario's emerging conservation market. The priority has been to develop the infrastructure and mechanisms necessary to build a culture of conservation. Besides designing and delivering conservation programs, marketing and research, the Ontario Power Authority actively engages key energy-sector organizations and forms partnerships to move toward Ontario's conservation goals. Activities in 2007 also include supporting other market players, such as local electricity distribution companies and various industry partners, in establishing cost-effective conservation programs.

There are a number of conservation program delivery channels in Ontario, including all levels of government, local distribution companies, private companies, non-profit organizations as well as the Ontario Power Authority. This chapter describes the Ontario Power Authority's 18 conservation programs in the market and an additional three in development, which are targeted at all sectors. It also describes other activities that are designed to bring about longer-term goals such as building a culture of conservation. The programs are intended to drive Ontarians to **ACT** on opportunities for conservation.

The Ontario Power Authority delivered programs in 2007 to achieve both short- and long-term electricity savings. These include:

1. mass market programs targeted at residential and small commercial customers
2. business market programs targeted at larger commercial, multi-unit residential, agricultural, industrial, low-income and social housing customers
3. demand response programs designed to shift load away from peak times
4. customer-based generation projects to offset load and deliver renewable and clean energy to the grid.

Activities related to conservation awareness, innovation and marketing in 2007 were undertaken in the following areas:

- codes and standards
- innovation and pilot program funding
- research and marketing
- evaluation, measurement and verification.

The results of the programs, including energy and demand savings, will be included in a supplement to the 2007 annual report expected in May 2008. The tables in this chapter provide summary information on each program. More detailed program information can be found in Appendix 1, available on the Conservation Bureau website, www.conservationbureau.on.ca.

ONTARIO POWER AUTHORITY AND LOCAL DISTRIBUTION COMPANIES WORK TOGETHER ON CONSERVATION

Seventy-seven out of 86 local distribution companies participated in summer conservation programs designed by the Ontario Power Authority. Ninety-nine percent of electricity customers in the province had access to at least one program.

To promote the launch of the programs, several local distribution companies undertook promotional campaigns to build awareness in their communities of the benefits of Summer Savings, ***peaksaver™*** and the Great Refrigerator Roundup. These launch events highlighted the electricity and financial savings, as well as the environmental benefits, associated with program participation. The Ontario Power Authority and the Chief Energy Conservation Officer were involved in many of these events, helping to build awareness of the programs.

The following table summarizes local distribution company participation in these mass market programs.

Program	Objective	Number of Participating Local Distribution Companies	Percent Coverage of Ontario Residential Customers*
The Great Refrigerator Roundup	Recycle two percent of refrigerators	75	99
Summer Savings	Raise awareness with residential customers	70	97
peaksaver™	Reduce residential peak summer demand	52	92

** Coverage is estimated as some areas may not have electricity service.*

TM of Toronto Hydro Corporation. Used under license.

MASS MARKET PROGRAMS

Mass market programs are targeted at residential and small commercial customers who use fewer than 50 kilowatts of electricity. These programs are typically delivered or advertised through mass media and large retail channels. In some cases, mass market programs are admininistered by third parties such as local distribution companies.

A summary of mass market programs in 2007 is provided in Table 4.1.

Table 4.1 – 2007 Mass Market Programs

Sector	Program	Description
Residential — existing buildings	**The Great Refrigerator Roundup** (local distribution company standard program)	Participants can have inefficient, operable refrigerators or freezers removed free of charge. The appliances are permanently decommissioned and disposed of in an environmentally sound manner. Scheduled to run from July to December 2007.
	Every Kilowatt Counts	An education and awareness-building program that offers financial incentives for the purchase of energy-saving products. Households across Ontario are mailed program brochures twice yearly, and coupons are redeemable at participating retailers across the province.
	Cool Savings Rebate	Program offers rebates for households that install a programmable thermostat or replace an existing central air conditioner and/or furnace fans with more energy-efficient systems.
Residential — demand response	***peaksaver*** (local distribution company standard program)	Program to reduce the load from central air conditioning units and/or hot water heaters of residential and small commercial customers. Participants receive a one-time $25 incentive. Load control devices are installed free of charge and can be controlled automatically by electricity aggregators during demand response events.
Residential — conservation	**Summer Savings** (local distribution company standard program)	Provides customers with a 10 percent credit on their fall 2007 electricity bill if they achieved a 10 percent reduction during the summer season. In operation from July 1 to August 31, 2007.
First Nations communities	**Energy Efficiency and Conservation Measures**	Participants are provided energy conservation kits, and youth are educated about the importance of electricity conservation. Audits and retrofit projects will assess the feasibility of a provincial retrofit program for First Nations communities.

BUSINESS MARKET PROGRAMS

Business market programs target commercial, industrial, institutional and agricultural customers. These businesses are large enough to be communicated with directly or through industry associations, such as the Building Owners and Managers Association. The programs are branded under the Ontario Power Authority's Every Kilowatt Counts for Business logo.

A summary of business market programs in 2007 is provided in Table 4.2. Low-income, social housing and demand response programs also were delivered under the Ontario Power Authority's business markets segment in 2007.

• LOW-INCOME AND SOCIAL HOUSING INITIATIVES

Low-income and social housing conservation initiatives are deployed across the province. Some of these programs also are available to First Nations. Key objectives are to:

1. capture potential energy savings in Ontario's social housing through lighting and appliance upgrades and building improvements
2. educate consumers about energy conservation
3. support program partners in the delivery of effective energy-management strategies as a means of improving the quality of housing in the low-income sector.

Table 4.2 – 2007 Business Market Programs

Sector	Program	Description
Commercial — existing buildings	Electricity Retrofit Incentive Program	Offers incentives for retrofits to eligible customers of local electricity distribution utilities. Runs from August to the end of December 2007.
Agricultural	Electricity Conservation on Ontario Farms	Program to increase participation of farmers in existing conservation opportunities, such as the Electricity Retrofit Incentive Program and the Ontario Power Authority's Standard Offer Program.
Large commercial	Building Owners and Managers Association - Conservation and Demand Management	Program provides eligible participants in Toronto with funds to defray the capital costs of demand-reducing and energy-saving initiatives in their buildings.
Various	City of Toronto – Better Buildings Partnership and Better Buildings New Construction Program	The Better Buildings Partnership implements energy-efficiency and building renewal retrofits in industrial, commercial, institutional and multi-residential buildings. The Better Buildings New Construction Program offers design assistance and financial incentives to increase the energy efficiency of new commercial, industrial, institutional or multi-unit residential buildings.
	Toronto Hydro Programs	Portfolio of programs available to commercial, office, retail, private institutions, hotel and multi-use properties under 25,000 square feet, as well as residential and industrial properties (refer to www.torontohydro.com).

Table 4.3 – 2007 Low-income and Social Housing Programs

Program	Description
Affordable Housing Energy Efficiency	Phase I will offer affordable housing providers up to $850 per unit to offset the cost of purchasing ENERGY STAR-qualified products and an education and awareness program for affordable housing stakeholders.
Energy Efficiency Assistance Program for Houses	Pilot program to support low-income homeowners and tenants with the tools they need to make more effective energy decisions. The pilot stage will be targeted at single, semi-detached and row houses.
Social Housing	The Social Housing Services Corporation manages aspects of this program as part of the corporation's Green Light Initiative, a province-wide initiative to help the social housing community reduce its energy use (refer to www.shscorp.ca).

Table 4.4 – 2007 Demand Response Programs

Program	Description
Demand Response 1	Voluntary peak shedding targeting only the highest-valued peak hours.
Demand Response 2	Contractual peak load-shifting for large customers targeting load savings during 1,000 hours of intermediate peak load days.
Demand Response 3	Higher-reliability contractual peak load-shedding targeting the 100 to 200 highest-value peak hours.

A summary of low-income and social housing initiatives in 2007 is provided in Table 4.3.

• DEMAND RESPONSE PROGRAMS

The Ontario Power Authority offers a suite of demand response programs that encourage either the shifting or shedding of electricity loads at peak times. Demand Response 1 was offered in 2006, and Demand Response 2 and 3 are currently being developed. The programs are market-based and designed for participation by organizations that can curtail load in response to economic signals or specific requests, primarily using existing equipment and processes.

The programs are voluntary and can be based on load interruption, load shifting or behind-the-meter generation (excluding diesel, coal, bio-fuel and bio-diesel).

A summary of demand response programs in 2007 is provided in Table 4.4.

DEMAND RESPONSE IN ACTION

Tembec, a Canadian integrated forest products company, was the first applicant to the Ontario Power Authority's demand response program in late June 2006. The program pays large electricity consumers for reducing power use during periods of high electricity demand. A rigorous set of criteria must be met before companies enrolled in the program can "bid into" the market. Terry Skiffington (second from right), vice-president and general manager for Tembec's Kapuskasing operations, received a Certificate of Recognition from Chief Energy Conservation Officer Peter Love (far right) for Tembec's support in helping to build and foster a culture of conservation .

Photo courtesy of *Kapuskasing Northern Times*

Kapuskasing Mayor Alan Spacek (far left) attended the event and praised Tembec's efforts. Attendees Jamie Lim (second from left), president and chief executive officer of the Ontario Forest Industries Association, and Barbara Mossop (not shown), the association's manager of environment and energy, were commended for their organization's efforts to advance energy conservation in a series of projects and benchmarking exercises with their member companies.

Table 4.5 – Renewable Energy Standard Offer Program Payment Regime

Project Type	Base Rate (cents/kilowatt-hour)	On-peak Performance Incentive Payment (cents/kilowatt-hour)
Solar photovoltaic	42.0	0
Other renewable projects	11.0	3.52

Source: Renewable Energy Standard Offer Program, Program Rules, Version 2.0, November 22, 2006, available on the Ontario Power Authority's website, www.powerauthority.on.ca.

CUSTOMER-BASED GENERATION

The Ontario Power Authority has developed a program to provide standard offer contracts for customer-based renewable and clean energy projects. The Renewable Energy Standard Offer Program, launched in November 2006, is the first of its kind in North America. The program rules for the Clean Energy Standard Offer Program are expected to be finalized in late 2007.

• RENEWABLE ENERGY STANDARD OFFER PROGRAM

This program provides a standardized pricing regime and simplified eligibility, contracting and other rules for small renewable energy electricity generation projects. Qualifying projects must use a renewable fuel source and cannot be more than 10 megawatts. Contracts are for a 20-year period. Renewable projects less than or equal to 500 kilowatts are counted toward Ontario's conservation targets.

Projects eligible for this program generate electricity from wind, solar photovoltaic, thermal electric solar, renewable biomass or waterpower. The standard offer provides a fixed price to generators per unit of energy produced and a higher price for projects demonstrating that they can operate reliably during peak hours. The payment regime is summarized in Table 4.5.

Since its inception, the program has received an exceptional response. As of August 31, 2007, the Ontario Power Authority had executed 140 contracts, 67 of which are less than 500 kilowatts in capacity.

• CLEAN ENERGY STANDARD OFFER PROGRAM

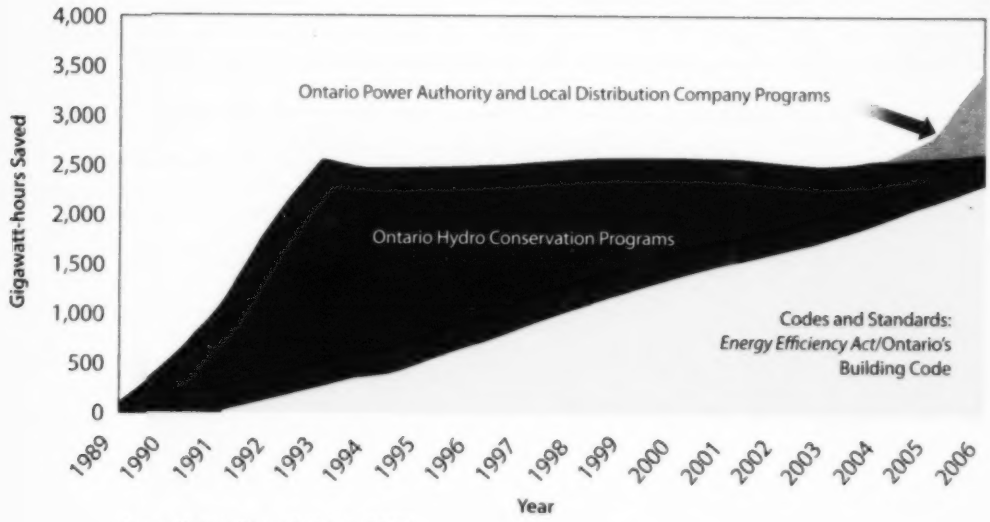
The Clean Energy Standard Offer Program under development is intended to support small clean energy (e.g., natural gas, waste heat) generation projects. The program is expected to result in approximately 140 megawatts of generation capacity by the end of 2010, all of which is considered as conservation. The program is planned to launch by the end of 2007.

OTHER CONSERVATION ACTIVITIES

• CODES AND STANDARDS

There has been considerable focus in 2007 on minimum energy performance standards. These standards establish the minimum acceptable level

HISTORY OF CONSERVATION SUCCESS IN ONTARIO



Source: Ontario Power Authority, 2007[1]

In the mid-1980s, the former Ontario Hydro embarked on an ambitious conservation strategy (referred to at the time as demand-side management). These programs continued until the early 1990s, when Ontario went into a recession and demand for electricity decreased. As shown, electricity savings from Ontario Hydro's conservation programs continued long after these programs were cancelled.

Since the early 1990s, codes and standards resulting from the passage of regulations under the *Energy Efficiency Act* and, to a lesser degree, changes to Ontario's Building Code, have also resulted in electricity savings.

In 2005 and 2006, electricity savings from new conservation programs run by the Ontario Power Authority and local distribution companies were evident. This, however, is just the tip of the iceberg for electricity conservation in Ontario. An estimated 3,500 gigawatt-hours of electricity were saved in 2006, and the Integrated Power System Plan calls for more than 25,600 gigawatt-hours of electricity savings by the year 2025.

of efficiency for specific equipment or processes. The key legislative tools for minimum energy performance standards affecting Ontario are the Ontario *Energy Efficiency Act*,[19] the federal *Energy Efficiency Act* and Ontario's Building Code. Changes made to these tools since January 1, 2005, are each estimated to have achieved approximately 10 gigawatt-hours per year, with a related three megawatts of annual demand reduction.[20] This is in addition to the impacts from codes and standards in place prior to 2005.

Ontario's Building Code is among the leading codes in North America for its minimum energy-efficiency standards. In 2006, the Ontario Power Authority participated in the process to amend the building code to include energy efficiency in building design and construction.[22] In 2007, attention was turned to equipment standards to drive energy-efficiency savings.

The Ontario Power Authority is engaged in four areas of activity relating to codes and standards: process and institutional development; research, planning and evaluation; standards development; and promotion of new standards. It also participated in a variety of groups, including the Consortium for Energy Efficiency, the Demand Side Management Working Group, its Subcommittee on Building and Housing Energy Labelling, the Energy Efficiency Working Group, the Strategic Lighting Initiative Committee and the Standby Power Advisory Committee. Details on the work of these groups and other related initiatives are provided in Appendix 2.

CONSERVE THE LIGHT GATHERING

LAUNCHES CONSERVATION PROGRAM FOR FIRST NATIONS

In May, First Nations delegates from across Ontario came together in Thunder Bay for a two-day Mana-cha-toon Wash-ti-ni-gun (Conserve the Light) Gathering. The gathering was both a platform for education about electricity conservation for First Nations and the launch of a province-wide electricity conservation program for First Nations communities. The program includes the distribution of about 23,000 energy conservation kits, which contain easy-to-install compact florescent light bulbs, faucet aerators and other devices that will result in immediate reductions in energy use. Comprehensive audits and retrofit pilots will also be undertaken in three communities to help assess the feasibility of a provincial retrofit program for First Nations communities. Charles Fox, program manager, shown above, addresses the gathering.

ROGERS CENTRE HITS HOME RUN ON ELECTRICITY CONSERVATION

The Toronto Blue Jays encouraged their fans to save electricity on July 22, 2007, designated as Electricity Conservation Awareness Day at Rogers Centre in Toronto. The Ontario Power Authority partnered with Rogers Centre and the Toronto Blue Jays to raise awareness and motivate fans to participate in the Ontario Power Authority's summer conservation programs: the Every Kilowatt Counts coupon campaign, ***peaksaver***, Summer Savings and the Great Refrigerator Roundup.

Rogers Centre is leading by example by installing energy-efficient measures that will result in about 1.5 megawatts of demand reduction. Paul Godfrey, Blue Jays and

Rogers Centre president and chief executive officer, says he's "much happier spending more of his budget on hitters rather than on wasted electricity." Peter Love, Chief Energy Conservation Officer, and Jan Carr, chief executive officer of the Ontario Power Authority, presented a Certificate of Recognition to Paul Godfrey for his leadership in implementing energy-efficient measures at Rogers Centre. Shown above is Rogers Centre, which contains a large infrastructure of energy-efficient lighting.

The Ontario Power Authority worked closely with the British Columbia Ministry of Energy and Natural Resources Canada to create and launch the Forum for Energy Efficiency Leadership, to promote coordination and collaboration among governments and utilities on longer-term regulatory planning. It has also been a leader in both the forum and the Demand Side Management Working Group to encourage collaboration among those involved in standards work. The goal is to improve and streamline the research, planning and evaluation necessary to support regulatory programs.

The Ontario Power Authority, British Columbia Hydro, Manitoba Hydro and Hydro-Québec have agreed to work with Natural Resources Canada to fund and support standards development at the Canadian Standards Association for several products. These processes are planned to be initiated or completed during the fiscal year 2007. Natural Resources Canada and the Canadian Standards Association have identified 34 new and existing projects requiring funding assistance. The Ontario Power Authority specifically funded a number of products, including large and small motors, lights and light fixtures, portable air conditioners, digital television adapters, external power supply and battery chargers, and appliances that use standby power. As vice-chair of the Canadian Standards Association's Strategic Steering Committee on Performance, Energy Efficiency and Renewables, the Ontario Power Authority is working to streamline the standards development planning process.

Also in 2007, the Ontario Power Authority began the process of promoting improved standards for residential appliances to support the provincial sales tax rebate and its own appliance retirement program. Research closely coordinated with utilities, regulators and others, including the Canadian Appliance Manufacturers Association, was undertaken to identify and justify improved standards in the residential sector.

• INNOVATION AND PILOT PROGRAM FUNDING

The Ontario Power Authority has developed two programs that promote innovative technologies and approaches to electricity supply and demand across Ontario. The Conservation Fund supports the development of promising conservation pilot programs. The Technology Development Fund supports emerging conservation or generation technologies.

Conservation Fund

The Ontario Power Authority established the Conservation Fund in 2005 to provide funding for sector-specific electricity conservation pilot projects. The goals of the fund are to:

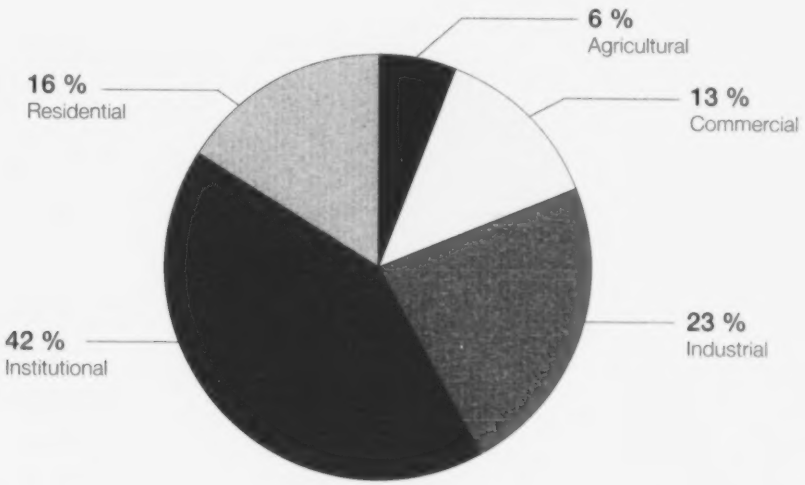
- build capacity for the design, delivery, marketing and uptake of conservation programs
- test new or unique conservation program elements
- use the results from pilots to inform the development of future conservation programs.

Rounding up inefficient refrigerators

Local distribution companies partnered with the Ontario Power Authority this summer to deliver several conservation programs, including the Great Refrigerator Roundup, a program to retire old, inefficient second fridges that can waste up to $150 a year in electricity. Customers can book an appointment online or by phone, and the fridge is picked up free of charge — even hauled out of the basement. The refrigerator is then disposed of in an environmentally responsible manner. Reusable material such as metal and plastic is recycled, chemicals are contained and destroyed in accordance with all government standards and regulations, and all that's left for landfill will just about fit inside a cowboy hat. The program has been extremely successful — as of the end of September, more than 20,000 appliances had been collected and removed from the electricity grid.

Canadian Football League celebrities helped launch the program with Horizon Utilities in Hamilton. Shown above (left to right) are current Hamilton Tiger Cat player George Hudson, former CFL great Angelo Mosca, Chief Energy Conservation Officer Peter Love, Horizon Utilities Chief Executive Officer Max Cananzi and CFL legend Ron Lancaster.

Figure 4.1 – Conservation Fund allocations from 2005 to June 30, 2007



The Conservation Fund's budget for 2007 is $3 million. There are three rounds of funding in 2007, two of which have been completed. In the first round, the fund committed $1.5 million of its budget for seven projects. In the second round, five additional projects were recommended for total funding of just under $1 million. The seven first-round projects are summarized below. Detailed project descriptions can be found on the Conservation Bureau website. The breakdown of total sector-specific funding since 2005 is shown in Figure 4.1.

- An energy-efficiency education program for trade contractors serving the small- and medium-enterprise sector to provide training and education for trade contractors
- The Ontario Forest Industry Association 2007 Energy Management Program to provide site energy audits, a roving energy manager, help desk services and the appointment of a part-time Energy Conservation Officer
- An energy management and engagement program for University Health Network hospitals, to increase awareness of electricity conservation and reduce overall consumption
- A direct install small business pilot project for small retail operations in four York Region business areas that will receive conservation upgrades, assessment and retrofit services
- ENERGY STAR for New Homes to improve the energy efficiency of new low-rise homes
- A residential pilot project to deliver energy-efficiency education to key commercial agents through market-driven incentives
- Greening Sacred Spaces – Phase II focusing on energy audits and retrofits in faith communities.

Since the fund started in 2005, the Ontario Power Authority has provided $5 million in funding for 49 projects in a range of sectors, including mining, forestry, agriculture, small business, schools, hospitals and religious communities. In addition, for every dollar of funding provided, an additional two dollars has been leveraged through partner support.

The first annual review of the Conservation Fund is available on the Ontario Power Authority website, along with comprehensive details on the pilot projects funded to date.

Technology Development Fund

The Technology Development Fund promotes the development and commercialization of technologies or applications that have potential to improve electricity supply, conservation or demand management. Technology development is an essential part of market transformation.

Applications for financial support are made exclusively through one of the fund's two managing institutions, the Ontario Centres of Excellence for projects involving partnerships with academia, and CEA Technologies Inc. for other projects. These managing institutions leverage additional funding and intellectual expertise on the Ontario Power Authority's behalf, providing support to universities and businesses to develop trials or validate emerging products.

The fund has a 2007 budget of $1 million. Funding to date in 2007 has resulted in the selection of four projects to receive just over $250,000.

In addition, the fund has leveraged $11 million in external contributions since it began, a ratio of more than 10 to one. The projects for 2007 are summarized below. Detailed project descriptions can be found in Appendix 3.

- Nanowire-based solar cells to enhance the efficiency of plastic solar cells
- New technology to reduce electrical energy consumption in mechanical pulping by 20 percent
- Variable-speed drive performance testing to establish the basis of a new standard for variable frequency drives
- Maestro demand response resource pilot project to develop a prototype for a set of controllers to reduce peak demand across a set of discretionary loads.

• RESEARCH AND MARKETING

The Ontario Power Authority conducts market research to inform the design and delivery of conservation programs and to measure the effectiveness of awareness-building activities. These efforts include polling, surveys, focus groups and marketing activities.

Province-wide polling has been conducted regularly since April 2007 to provide information on the awareness, opinions and participation in mass market conservation programs. The polls also provide insights on whether the programs are effective in establishing a culture of conservation. Results show that the conservation programs are successful in gaining attention and that people are

participating. About three in four Ontarians were aware of the spring 2007 Every Kilowatt Counts program, and as many as one in four households redeemed a program coupon.[23]

The same research indicates that more than 80 percent of Ontarians are aware of the Ontario Power Authority's programs. These programs are believed to be effective at encouraging people to conserve electricity, and Ontarians say the Ontario Power Authority offers the kinds of programs that make sense for them and others in their households.[24]

This and other market research have contributed to the development of conservation messaging and programs. Early in 2007, focus groups and surveys helped identify how effective brand positioning could persuade people to use electricity wisely and take actions to conserve. The results are being used in developing effective messages to promote programs under the Every Kilowatt Counts banner.

Focus groups held with contractors delivering the Cool Savings program revealed opportunities to improve program operations in 2007.[25] Other research tracked the impacts of an advertising campaign to increase participation in the Electricity Retrofit Incentive Program in the agricultural sector. Research results showed that the campaign was successful at making energy efficiency more relevant to farmers and also suggested strategies for future campaigns.[26] Similar market research initiatives will continue in 2008.

• Evaluation, Measurement and Verification

The Ontario Power Authority is developing processes to assess the overall effectiveness of its conservation programs, measure energy and demand savings impacts and determine overall cost-effectiveness. Evaluation, measurement and verification will be used to confirm that the province has met its conservation targets, enhance the quality of data for forecasting and verifying conservation potential, and inform new and existing program design and development.

- **Evaluation:** This refers to using measured and verified information, as well as insights gained through experience, to assess the value (primarily energy and demand savings) of conservation programs. Evaluation can be used to determine whether program modifications are needed or if funding increases or decreases are justified.
- **Measurement:** This refers to measuring pre- and post-conservation program conditions. Techniques include surveys and on-site measurement, which can confirm the assumptions used to estimate the baseline conditions affecting energy use.
- **Verification:** This refers to verifying that equipment installations or behaviour changes reported by program delivery agents have occurred and that the installed equipment or other program measures are working correctly.

CHAPTER 5

THE ONTARIO POWER AUTHORITY'S PROPOSED 2008 CONSERVATION PROGRAMS

The Ontario Power Authority is leading Ontario's efforts to achieve electricity conservation in 2008 and beyond. The key focus areas that correspond to the Ontario Power Authority's mandate are building a culture of conservation, planning the power system for the long term, ensuring development of needed generation resources and supporting the continued evolution of the electricity sector. All four of these focus areas depend on continued conservation success. One of the Ontario Power Authority's five strategic objectives in 2008 is to *"contribute to the achievement of Ontario's conservation resource targets and to fostering a culture of conservation using market-based approaches."*[27]

To meet this strategic objective, the Ontario Power Authority plans to implement a portfolio of 27 conservation programs in 2008. Several programs will continue from previous years and others will be newly designed and delivered by the Ontario Power Authority and other delivery channels, such as local distribution companies. In addition, the conservation program portfolio for 2009 will be identified and resources procured. The Ontario Power Authority will develop a conservation service industry by outsourcing conservation services rather than directly providing programs to the extent feasible.

In 2008, the Ontario Power Authority will continue to promote legal and policy opportunities that support energy efficiency, report to the public on conservation results, and implement an evaluation, measurement and verification system to measure conservation program results. Through the Conservation and Technology Development Funds, the commercialization of new technologies consistent with the Ontario Power Authority's mandate will be supported.

Another key focus area will be developing public awareness. In addition to the activities of the Chief Energy Conservation Officer, the Ontario Power Authority will develop education programs for Ontario youth and promote brand awareness of "Every Kilowatt Counts," which will become the overarching brand used in programs to influence behaviour that leads to wiser use of electricity.

CONSERVATION RESOURCES PLANNED FOR 2008

Table 5.1 summarizes planned 2008 conservation resources by program and target. These programs are expected to provide approximately 1,230 megawatts of peak-demand reduction in the 2008 to 2010 period. Other sources, particularly smart meters in conjunction with time-of-use commodity prices, are expected to contribute an additional 176 megawatts. More details on the Ontario Power Authority's 2008 conservation programs can be found in Appendix 4.

Table 5.1 – 2008 Planned Conservation Resources

Program Type	Program	Estimated Peak Demand Reduction (megawatts)*	
		Target	Net Reduction**
Mass markets	New Construction Program	45	32
	Existing Buildings Retrofit Programs	242	169
	Low Income and First Nations	16	11
	Demand Response Program	105	74
Commercial/institutional	New Construction Programs	55	39
	Existing Buildings Retrofit Programs	492	344
	Socially Assisted Housing Programs	29	20
Industrial	Industrial Programs	113	79
	Demand Response Programs	451	316
Customer-based generation	Standard Offer Programs***	211	148
Other programs	Smart Meters and Time-of-Use Pricing	176	176
TOTAL		**1,940**	**1,410**

Source: Ontario Power Authority

Notes: * *Totals are rounded to the nearest 10 megawatts.*

** *Net reduction is listed less free riders. A free rider is defined as a program participant who would have installed a measure on his or her own initiative without the program. The free rider rate is assumed to be 30 percent of the total estimated program demand reduction and is not counted toward meeting conservation targets.*

*** *Clean energy standard offer projects equal to 10 megawatts or less and renewable energy standard offer projects equal to 500 kilowatts or less are considered as conservation.*

Mass Market Programs

Mass market programs target small electricity consumers that are too numerous to be communicated with directly. The programs are advertised through mass media, local distribution companies and/or large retail channels. For 2008, the Ontario Power Authority is considering ways to extend the delivery reach of mass market programs through the engagement of more community-based organizations.

Table 5.2 – Proposed Mass Market Programs for 2008

Sector	Program	Description
Residential	New Construction	Program to improve the energy efficiency of new single-family and townhouse homes.
Residential existing buildings retrofit	Local Distribution Company Custom Programs	Allows local distribution companies to submit program proposals based on their understanding of local market needs. Proposed programs must comply with specified design and performance criteria.
	Community Engagement	Will explore the use of community-based agencies and organizations as delivery channels to provide education and efficiency measures to mass market customers.
	New Appliance	Retail-based program aimed at improving the efficiency of electric appliances and supporting new appliance standards.
Low-income and First Nations	Single Family Low-Income Housing	Program will assist low-income households manage electricity use with free electric energy-efficiency and fuel-switching measures. It will work with social benefits agencies to identify participants.

Table 5.2 shows the mass market programs planned for 2008 that will deliver results in the 2008 to 2010 period. These programs are in addition to the 2007 programs described in Chapter 4 that are likely to continue in 2008, including Summer Savings, ***peaksaver***, the Great Refrigerator Roundup, Every Kilowatt Counts, Cool Savings Rebate and energy-efficiency and conservation measures for First Nations communities.

Commercial/Institutional Market Programs

The Ontario Power Authority will expand the offerings to commercial and institutional markets in 2008. Table 5.3 summarizes the new commercial/institutional market programs that will deliver results in the 2008 to 2010 period. The Electricity Retrofit Incentive and the Electricity Conservation on Ontario Farms programs, active in 2007, are expected to continue in 2008.

Industrial Market Programs

The emphasis for the industrial market is not only on improving technology and industrial process efficiency — it is also on developing energy-management knowledge, expertise and acceptance at all levels of an organization, as well as on building expertise in the service and supply chains that serve the market. Industrial markets are the primary targets for demand response programs.

The Ontario Power Authority is considering adding a fourth demand response program in

Table 5.3 – Proposed Commercial/Institutional Market Programs for 2008

Sector	Program	Description
Commercial/ institutional	High Performance New Construction	Will assist the incorporation of conservation measures into the design, construction and operation of new buildings and major renovations. Buildings are intended to exceed the Model National Energy Code of Canada for Buildings[18] with graduated incentive levels for higher performance.
Small commercial	Commercial Direct Install	A retrofit program that includes a pre-defined set of energy-efficiency measures focusing on more efficient lighting and heating, ventilation and air conditioning equipment.
Large commercial	Large Commercial Buildings	Promotes retrofits in large commercial, institutional and multi-family buildings in Toronto. Program includes the Building Owners and Managers Association Toronto Conservation and Demand Management program.
Multi-unit residential	Multi-Family Buildings	Program addresses building retrofits to improve energy efficiency and implement fuel switching in multi-family buildings, combined with educational initiatives for tenants and building operators.
Commercial — general	Fuel Switching	Program to acquire fuel-switching resources that contribute to peak demand reduction, primarily in the commercial sector.
Commercial — existing building	Building Recommissioning	Targeted at building operators to encourage thorough review of operating characteristics of large buildings, maintenance of optimal equipment use and setup, and properly calibrated equipment.
Institutional — general	Institutional Buildings	Program to address unique needs of institutional markets. It will build on the work done that has been funded in part by the Ontario Power Authority's Conservation Fund .

2008. It would be developed based on the experience gained and observed gaps from the first full year of operation of the existing demand response programs. Table 5.4 shows the new industrial market program planned for 2008.

Customer-Based Generation

The Ontario Power Authority will continue to administer the Renewable Energy Standard Offer Program and Clean Energy Standard Offer Program, expected to be launched in late 2007.

Other Conservation Activities

The activities that support conservation described in Chapter 4 are planned to continue in 2008. These include developing codes and standards; innovation and pilot program funding; and evaluation, measurement and verification of conservation programs.

Table 5.4 – Proposed Industrial Market Programs for 2008

Sector	Program	Description
Industrial	Industrial Process and Technology	Programs to improve energy efficiency in the industrial sector, by providing evaluation and optimization to encourage increased efficiency for particular end-uses, such as driven loads, compressed air, lighting, and refrigeration and cooling.

In 2008, the Ontario Power Authority will again take a leadership role in promoting regulation of codes and standards to achieve its long-term goals. It will engage in activities to support increases to minimum energy performance requirements for specified products and buildings. Commercial and residential cooling is expected to be a key area of focus in 2008.

The Ontario Power Authority plans to implement a web-based evaluation, measurement and verification tracking system in 2008. It is making a significant investment in these efforts.

CHAPTER 6

FINDINGS AND RECOMMENDED ACTIONS

The Chief Energy Conservation Officer is required by 2004 amendments to *The Electricity Act, 1998*, to identify government policy or legislation that results in a barrier to developing or implementing electricity conservation measures. This chapter presents findings and recommended **ACTIONS** to government and others to help achieve Ontario's conservation goals. The recommendations are based on research, participation in forums and consultations with a wide range of stakeholders.

In the 2006 annual report, the Chief Energy Conservation Officer made 17 recommendations to which the Government of Ontario has responded. An update on government actions taken in response to the 2006 recommendations is provided in Chapter 7.

ONTARIO'S ENERGY CONSERVATION POLICY

Ontario has many electricity-related policies in place, but more needs to be done to ensure that energy conservation policy is applied in a cohesive manner by all government agencies. There would be significant benefits to a comprehensive and coordinated energy policy that lays out, in a single government document, policies and positions on the conservation of electricity and all other energy forms. To align future energy policy initiatives with existing ones, such as substituting other fuels for electricity, the Ontario government should develop a unified energy conservation policy that relates to a broader range of energy forms and sources. The rededication of the government's Conservation Action Team could assist in this process.

Furthermore, government ministries and agencies can impact energy use, through mechanisms such as procurement and internal policies. All ministries and agencies, therefore, should consider energy conservation as they develop policies and programs in their mandate areas. For example, the *Environmental Bill of Rights* requires 13 ministries to prepare a Statement of Environmental Values to ensure that the government takes the environment into account in its decision-making. By including a commitment to energy conservation in these statements, ministries would demonstrate leadership and dedication toward building a culture of energy conservation.

Recommended Action 1: The Ministry of Energy should develop a comprehensive and cohesive energy conservation policy for all government departments that aligns the province's electricity policies with other related policies. All government departments should be required to consider this policy in their decision-making processes, and prescribed government ministries should be required to include a commitment to energy conservation in their Statement of Environmental Values.

Role of the Chief Energy Conservation Officer

To help build a culture of conservation in Ontario, the Chief Energy Conservation Officer is a leading public advocate for energy conservation. Electricity is inherently related to other forms of energy, and conservation opportunities exist for all of these. To be even more effective, the Chief Energy Conservation Officer's advocacy role could be expanded to address conservation issues relating to other forms of energy, particularly natural gas and possibly transportation fuels in the longer term.

Similar to the Chief Energy Conservation Officer's existing role for electricity, this reconfigured role could include working with energy management companies to promote conservation awareness and publicize successes for conservation of other energy forms, identifying barriers to further conservation and thereafter seeking to have them removed. As the Chief Energy Conservation Officer's role is currently funded by electricity ratepayer funds, alternative funding models would need to be explored to implement this change.

Recommended Action 2: The government should reconfigure the role of the Chief Energy Conservation Officer to include advocacy for conservation of other forms of energy used in Ontario, including natural gas and transportation fuels.

Ontario's Building Code

Recent changes to Ontario's Building Code include provisions for energy efficiency in buildings. The 2006 Building Code also includes enabling provisions to promote the use of green technologies such as solar photovoltaic systems, gas-fired emergency generators, solar hot water systems, wastewater heat recovery systems and motion sensors for lighting.

These changes are a notable improvement; however, significant gains in energy efficiency could be achieved by applying standards to renovations and retrofits. Incentives and information programs in the private sector are leading to improvements in these areas, but further work needs to be done. The right tools must be available to industry practitioners so that all new and existing buildings subject to Ontario's Building Code maximize opportunities for conservation in the most cost-effective manner. The timing of the changes must allow for their consideration in advance of the Model National Energy Code of Canada for Buildings 2010 approval cycle. Ontario also needs to remain active in the federal process to update the Model National Energy Code of Canada for Buildings, particularly with respect to its commercial lighting provisions.

Recommended Action 3: The Ministry of Municipal Affairs and Housing should prepare a plan for the orderly consideration of energy efficiency in all renovations and retrofits.

Minimum Energy Performance Standards

Codes and standards and other legal and policy tools are among the most effective ways to achieve the province's conservation goals. Working closely with the Ontario Power Authority and regulators across Canada to identify opportunities for coordinated approaches, the Ontario government should identify priorities to 2025 and develop action plans to support the continuous improvement of minimum energy performance standards for buildings and equipment.

To date, 13 regulatory amendments to Ontario's *Energy Efficiency Act* have established minimum efficiency levels for more than 50 product categories that consume 80 percent of the energy used in the residential sector and 50 percent used in the commercial/institutional sectors. The Ministry of Energy estimates that these regulations cover 95 percent of the energy consumption also covered by California's regulations, thus making Ontario a leader in this area. Further information on the federal and provincial *Energy Efficiency Acts* is provided in Appendix 5.

Ontario needs to continue to work with other leading jurisdictions in North America on minimum energy performance standards. Two key objectives in using the *Energy Efficiency Act* to date have been to eliminate energy-inefficient products from the marketplace and promote the development of more energy-efficient products in the future. The focus has been on removing the poorest-performing products; however, the approach going forward should be to set standards that increase the minimum energy-efficiency performance for all products. To achieve this shift in a cost-effective and timely manner, the Ontario government should coordinate its development of standards with jurisdictions such as British Columbia, California and others that are active in this area.

Ontario's Building Code was updated in 2006 to include the established EnerGuide 80 standard as the minimum energy efficiency for new buildings by 2012. Just as an established standard for buildings in Ontario was used to drive the energy efficiency of new homes to the highest levels in North America, Ontario could take a similar approach to increase the energy efficiency of major home appliances.

Recommended Action 4: The Ministry of Energy should raise the minimum energy performance standards for the six consumer products currently exempt from provincial retail sales tax (refrigerators, freezers, dishwashers, clothes washers, dehumidifiers and air conditioners) to the highest levels in North America.

Low-income households may face greater or disproportionate economic burdens in upgrading to energy-efficient products as a result of new codes and standards, such that the additional upfront costs can be a barrier to conservation action. Options to overcome this hurdle should be considered, including a provincial sales tax rebate

on all affected products as a means of providing ongoing support. This could be a time-limited rebate to allow the market to adjust to the change. For example, a provincial sales tax rebate could be given on all products affected by updated codes and standards for one year after the new standards take effect.

Recommended Action 5: The government should evaluate options to assist households defined as low-income to deal with economic burdens associated with upgrading to energy-efficient products affected by new codes and standards.

Energy Conservation Leadership in Public Agencies

The activities and leadership of public sector agencies are important in creating a culture of conservation. In addition to the provincial government itself, the public sector includes 490 municipalities and local service boards, more than 210 hospitals and long-term care facilities, 104 school boards and 46 colleges and universities. The public sector is diverse not only in how it uses energy but also in its capacity to take action. As with other sectors, conservation is one of a number of competing priorities for scarce resources.

As a starting point, public agencies need to include energy conservation in their planning and decision-making processes. They also need to be informed of how they use electricity, how much they are using and how they can change their behaviour to conserve. Energy conservation plans can be an important means of achieving conservation targets. In the public domain, these plans can be used for benchmarking, a valuable management technique that could be used in the broader public sector more effectively. To ensure that the plans are created and implemented in a meaningful manner, the differing sizes, resources and locations of the agencies will need to be taken into consideration.

The *Energy Conservation Leadership Act, 2006*, is a powerful tool for achieving energy conservation, as it empowers the provincial government to promote energy conservation in the province's public agencies. Regulations pursuant to this Act should be developed and supported to further the province's energy conservation goals. Subsection 4(1) of this Act authorizes the use of regulations to require public agencies to prepare energy conservation plans on an annual or other specified basis. The government has held consultations with a number of representatives in this sector, but no proposals for draft regulations have been posted to date. The rollout of the regulations should be sensitive to the state of readiness and capacity to take action within the sector.

Recommended Action 6: The Ministry of Energy should issue regulations requiring public agencies to prepare annual energy conservation plans with a high priority on implementing energy conservation measures in their daily operations and capital projects.

Municipal Zoning By-laws and Permitting Requirements

In several cases, municipal zoning bylaws and permitting requirements act as unintended barriers to conservation. For example, some current municipal restrictions prohibit combined heat and power energy projects, clotheslines or solar collectors. These restrictions are out of step with current conservation practices and should be updated to recognize the importance of energy conservation.

Combined heat and power energy projects historically have involved heat sources and large industrial sites. Recent advances in small-scale combined heat and power and renewable energy technologies enable smaller heat sources or heating loads to be candidates for combined heat and power systems. As a result, there is an increasing opportunity for these systems to be located in non-industrial areas and generate electricity closer to loads, such as in office towers, apartment buildings, shopping centers and residential district heating systems.

Electric clothes dryers are the third highest energy-consuming appliance in the home. They are not ENERGY STAR-rated since all units use more or less the same amount of electricity. Using clotheslines to dry clothes is a sound conservation practice. For this reason, the continued existence of local covenants restricting outdoor clotheslines has led to a number of efforts to permit their use, including a "right to dry" movement spearheaded in 2006 by the Mayor of Aurora and others.

Similar to combined heat and power projects, solar thermal or photovoltaic collectors historically have been considered industrial developments. In some cases, their application is limited under residential zoning.

To assist in removing unintended barriers and to promote opportunities for energy conservation, subsection 3(2) of the *Energy Conservation Leadership Act* authorizes designated goods, services and technologies to be used despite legal restrictions that would otherwise prevent their use.

Recommended Action 7: The Ministry of Energy should issue regulations under the *Energy Conservation Leadership Act* to designate combined heat and power projects, clotheslines and solar collectors so that they may be used where there are restrictions, such as municipal zoning by-laws, that would otherwise prevent or impede their use.

Building Labelling

There is considerable interest in the use of labelling as a benchmarking and regulatory tool to identify energy-efficient design and retrofit efforts in commercial and institutional buildings. In 2006, a multi-stakeholder subcommittee[39] was formed under the auspices of a federal/provincial/territorial committee reporting to the Council of Energy Ministers. Its role was to assess existing energy labelling programs from other jurisdictions and explore the potential for introducing a voluntary building label in Canada. The label would identify

and display energy performance, such as consumption, energy intensity or some closely related parameters for commercial, institutional, multi-unit residential and government buildings.

Several building energy labelling pilot projects are being developed across the country to test assumptions and administrative processes for implementing building labels. In conjunction with these pilots, work is underway with stakeholders to determine the kinds of information that could reside in a database of labelled buildings in Canada. Subsection 2(1) of the *Energy Conservation Leadership Act* permits the government, by regulation, to require anyone selling, leasing or otherwise transferring an interest in real or personal property to provide energy-related information. The regulation could be written to mandate an energy consumption label.

Recommended Action 8: The Ministry of Energy and the Ministry of Municipal Affairs and Housing should collaborate with the federal government and other provinces to introduce voluntary labelling of the energy performance of all new and resale buildings coincident with the current Ontario Building Code review cycle, with the intent of issuing a regulation to require labels for all new and resale buildings.

Municipal Energy Conservation Leadership

The involvement of local governments, businesses and consumers is important in raising conservation awareness and creating a culture of conservation. At the annual conference of the Association of Municipalities of Ontario in August 2007, the Chief Energy Conservation Officer called on the province's municipalities to appoint Municipal Energy Conservation Officers to help build a conservation culture.

A strong local presence will be pivotal in engaging communities and individuals in Ontario's conservation efforts. Several municipalities already have similar full-time positions, including the cities of Hamilton, Markham and Toronto and the Region of Peel. Other municipalities have individuals who devote time to advocate for energy conservation. Institutionalizing a defined role for energy conservation at the municipal level could play an integral role in achieving the province's conservation goals. The Ministry of Municipal Affairs and Housing could support the municipalities with this new role.

Recommended Action 9: Ontario's municipalities should appoint Municipal Energy Conservation Officers to engage communities at the local level in creating a culture of conservation throughout the province.

Government Procurement

The Government of Ontario has policies on how goods and services are procured. Due to the size of its operations, government procurement policies can have a significant impact on supply chains for energy-efficient products and services. By purchasing more energy-efficient devices and equipment, government ministries can achieve a significant reduction in electricity use while supporting market transformation in the longer term. For example, all office equipment purchased or leased should be required to meet current ENERGY STAR requirements.

Recommended Action 10: All government procurement policies and contracts should include current ENERGY STAR requirements for energy efficiency where available.

Electricity Charges and Billing

During recent consultations with large business customers, pricing information and transparency were identified as main barriers to conservation actions.[30] A summary of these consultations is provided in Appendix 6. By providing appropriate information to help electricity users conserve electricity and shift their time of use, electricity bills can be an important tool in developing a culture of conservation.[31] Examples of data that could be included are the relation between time-of-use and peak system demand, and comparisons to previous billing periods. Some utilities already provide this material to their non-residential customers.

The Ontario Energy Board is currently involved in processes to address pricing mechanisms and fairness issues that might result from these mechanisms.

Recommended Action 11: The government should ensure that future changes to the way electricity bills are presented to consumers provide enough information and transparency to enable them to make better decisions about electricity use.

Ontario has surpassed its target of installing 800,000 smart meters by December 31, 2007. To maximize the effectiveness of these technologies, the focus needs to shift to providing education and tools to help consumers better understand their energy consumption. Research will be essential to identify the tools people need to evaluate their consumption habits and make decisions about their patterns of electricity use. The process will require leadership and innovation to ensure that the best possible approach is taken. The government will need to determine the most appropriate agency to fulfill this important role.

Recommended Action 12: The government should work with the appropriate players in the electricity sector to coordinate research and develop educational programs and tools needed to enable customers to learn about and benefit from the use of technologies such as smart meters.

CHAPTER 7

2006 RECOMMENDATIONS OF THE CHIEF ENERGY CONSERVATION OFFICER

This chapter includes recommendations of the Chief Energy Conservation Officer made in 2006 and a summary of the government's actions taken in response to the recommendations.

Recommendation 1: All new government building construction should use the 2012 Ontario Building Code requirements as a minimum. New and green technologies should also be explored.

On June 1, 2007, the Minister of the Environment announced that Leadership in Energy and Environmental Design (LEED) will be the design standard for all new government-owned construction.

Recommendation 2: Government procurement contracts must specify high energy efficiency as a minimum requirement.

The Ontario Realty Corporation has strengthened its standard lease form to reflect the government's conservation priorities. Specifically, Schedule "K," entitled Conservation of Energy and Water, has been added to the lease. It states that landlords agree, wherever possible, to adhere to certain procedures relating to lighting, heating and cooling, and water. The government reports that landlords have been receptive to the lease changes. The new schedule is being used, where feasible, in all new lease negotiations with private-sector landlords and in renewals of existing leases.

This recommendation has been made again in 2007. Recommended Action 10 of this report calls for further action in this area.

Recommendation 3: The government should continue to actively seek stakeholder advice on conservation targets through stakeholder groups as appropriate and other mechanisms.

Broad-based stakeholder consultations on targets were the basis for the 6,300 megawatt target. The Ontario Power Authority, as required by legislation, used a public process to develop the plans for meeting these targets. Ontario has also been an active participant in a federal, provincial and territorial process involving extensive consultation to create a conservation action plan for the Council of Energy Ministers. In addition, the Energy Efficiency Working Group, the National Roundtable on the Economy and the Environment, and the Council of the Federation's Energy Strategy provide consultation opportunities for the provincial government.

Recommendation 4: The Conservation Action Team should act on its expanded role and leverage other cross-ministerial forums to provide consistency and coordination of conservation policy and action across the government.

Taking Action

The Conservation Action Team met monthly in 2004 and delivered its report to the Minister of Energy in January 2005. It reconvened in mid-2006 and held meetings in May and June. Following the appointment of a new parliamentary assistant in late 2006, the team reconvened in the spring of 2007. Recommended Action 1 of this report calls for a rededication of the Conservation Action Team.

Recommendation 5: The government should publish its energy and conservation policy in one summary document.

Although the government uses several methods to communicate policy, including speeches, press releases, publications, legislation and regulation, the conservation strategy is explained in detail on the Ministry of Energy website.[32] The government's submission to the Canadian Energy Efficiency Alliance in 2006, also on its website, is a compilation of achievements and future directions in conservation. Recommended Action 1 of this report calls for further action in this area.

Recommendation 6: Ontario should continue to match California's standards and work with California and other leading jurisdictions on the introduction of new standards in the future.

Ontario has already harmonized its current standards in Ontario's *Energy Efficiency Act* with American organizations such as the Department of Energy and the California Energy Commission. These organizations and other industry associations also participate on Canadian Standards Association committees to ensure that new standards are harmonized to the extent possible. In 2007, the Chief Energy Conservation Officer recommends that Ontario pursue standards that are the highest in North America (see Recommended Action 4 of this report).

Recommendation 7: Ontario should work with other jurisdictions to adopt a one-watt standard for load losses associated with standby losses.

The Canadian Standards Association is currently working on television set-top boxes and power supply standards. These standards are expected to be completed during the last quarter of 2007 and will harmonize with the United States Department of Energy standards.

Recommendation 8: Ontario should incorporate the A440.2-04 window performance standard for replacement windows into the Ontario *Energy Efficiency Act.*

This standard is currently being reviewed and is expected to be ready for approval in 2008. Adequate lead time is required to allow small manufacturers to have their products verified.

Recommendations 9 and 10: Develop a market transformation strategy to ensure achievement of the Part 2 and Part 9 target by 2011.

The government, through the Ministry of Municipal Affairs and Housing, is working to ensure that the requirements of Ontario's Building Code for 2007 are met. It will continue its efforts to achieve compliance with future modifications to the code.

Recommendation 11: Put in place a process to ensure ongoing facilitation of green technologies.

Green technologies are supported through various mechanisms such as tax exemptions for residential renewable installations, rebates for various green technologies as recommended in energy audits and a commitment to 100,000 solar roofs. In addition, the Ontario government is providing a grant to the World Green Building Council to support its activities in its new worldwide headquarters in Toronto.

Recommendation 12: Begin discussion on how to ensure that energy efficiency is considered in renovations.

Ontario's Building Code has specific provisions for renovations that require major renovations to adhere to latest code standards. Recommended Action 3 of this report calls for further action in this area.

Recommendation 13: Begin to develop a vision for Ontario's Building Code beyond 2011.

Through activities such as supporting the ENERGY STAR standard for new homes, rebates for green technologies undertaken as part of energy audits, tax exemptions for renewable installations and other market transformation activities, the government is promoting advanced building technologies and techniques that can be used as the basis for future code revisions.

Recommendation 14: Develop meaningful regulations under the *Energy Conservation Leadership Act, 2006*, to address barriers to conservation and to promote leadership by the broader public sector in energy conservation.

The government actively consults with many in the municipalities, universities, schools and hospitals sector and has been working with government building owners and experts to develop a better understanding of what would be needed in a regulation to require this sector to post energy conservation plans. Recommended Actions 6, 7 and 8 of this report call for further action in this area.

Recommendation 15: Review land use policies to establish density requirements in existing and future developments.

Recommendation 16: Consideration should be given for site design and the implementation of energy efficiency and renewable energy in land use policies.

No comments were received from the Ontario government in response to recommendations 15 and 16.

Recommendation 17: Ensure that electricity savings are considered in the implementation of the 2005 Greenbelt Protection Plan.

Urban design is an important factor determining overall energy use. The Ontario government's creation of a greenbelt offers new incentives for greater building and community density with reduced energy use.

REFERENCES AND NOTES

CHAPTER 1

[1] The net metering program allows eligible generators to send electricity generated from renewable sources to the electrical grid for a credit toward their energy costs. The utility subtracts the value of electricity supplied to the grid from the value of what is used from the grid. The generator is then billed for the "net" difference between these two amounts. For more information, see www.energy.gov.on.ca/index.cfm?fuseaction=renewable.netmetering.

[2] See the Ontario Power Authority website at www.powerauthority.on.ca for documents relating to the Integrated Power System Plan.

CHAPTER 2

[3] A certificate recognizes the leadership role taken by individuals and organizations that have made long-term commitments to conserve electricity in Ontario. A list of 2007 recipients is located at www.conservationbureau.on.ca/Page.asp?PageID=122&ContentID=1709.

[4] Conservation Bureau, 2007.

[5] For more information about this research, see *Consumer Usage and Attitude Market Research, Ontario Consumer Market Research, on Attitudes and Behaviour Toward Electricity Conservation, 2007 Baseline Study*, April 2, 2007, Environics Research Group, available at www.powerauthority.on.ca in the Conservation/OPA Market Research section.

[6] For Canada's greenhouse gas emissions, see *National Inventory Report, 1990 – 2004, Greenhouse Gases Sources and Sinks in Canada* at www.ec.gc.ca/pdb/ ghg/inventory_report/2004_report/ta9_7_e.cfm.

For Ontario's electricity system greenhouse gas emissions, see *Sustainable Development 2006 Report*, Ontario Power Generation, at www.opg.com.

[7] Integrated Power System Plan, Exhibit G-3-1, Consideration of Safety, Environmental Protection and Environmental Sustainability.

[8] The report, entitled *Introducing Ontario Power Authority's Consumer Segments 2007*, is available on the Ontario Power Authority website in the Conservation/OPA Market Research section.

[9] *Teen Attitudes Towards, and Awareness of, Electricity Conservation in Ontario: Study Highlights*, Draft of the Final Report to the Ontario Power Authority, June 20, 2007, Prof. Jennifer Lynes & Jennifer Robinson, Faculty of Environmental Studies, University of Waterloo, available on the Ontario Power Authority website in the Conservation/OPA Market Research section.

CHAPTER 3

[10] Variations in weather patterns have considerable impact on observed peak load data. For example, an extremely hot summer can cause an increase in peak demand of up to 10 percent as air conditioning and other loads are increased to compensate.

[11] The 1,350 megawatt target for 2007 peak demand reduction was confirmed in the June 2006 directive for the preparation of the Integrated Power System Plan from the Minister of Energy to the Ontario Power Authority.

[12] Weather-normalized peak readings are calculated by comparing the actual weather conditions observed on the peak day in any one year with the "normal" weather conditions for that season over a 10-year period and then adjusting the observed peak for the key day up or down. If the conditions on the peak day were 10 percent hotter than the normal weather, then the peak value is lowered by 10 percent. Forecasters use a combination of temperature and humidity readings, and wind and cloud-cover data to perform the actual correction in a statistical model operated by the Independent Electricity System Operator.

[13] www.oeb.gov.on.ca/html/en/consumers/energyoptions/fs_timeofuse.htm.

[14] Ontario's Refrigerants Regulation (O. Reg. 180/07) requires the conversion from or replacement of existing chlorofluorocarbon-based chillers to a non-ozone-depleting substance alternative. The updating and possible downsizing of existing chillers could lead to energy savings from 51 to 175 megawatts under a number of scenarios evaluated by Marbek Resource Consultants Ltd. See *CFC Chiller Replacement Potential*, February 2006, available at www.conservationbureau.on.ca.

[15] Natural Resources Canada

[16] The figures are based on information provided to the Conservation Bureau by Hydro One, the Coalition of Large Distributors, Cornerstone Hydro Electric Concepts and the Niagara Erie Power Association and represent only a portion of the existing conservation programs.

[17] A summary of third tranche conservation and demand management activities can be found on the Ontario Energy Board's website in the Conservation and Demand Management section at www.oeb.gov.on.ca/html/en/industryrelations/ongoingprojects_cdm_thirdtranche.htm.

[18] "Ontario — a new era in electricity conservation," Annual Report 2006, Chief Energy Conservation Officer, Nov. 1, 2006.

CHAPTER 4

[19] Ontario's *Energy Efficiency Act*, administered by the Ministry of Energy, enables the government through regulation to set minimum energy performance standards for products and equipment used in the residential, commercial and industrial sectors. Retailers may only sell or lease new products past a compliance date if they have been verified to meet specific minimum energy-efficiency levels.

Amendments to regulations under the Act are made periodically and reference minimum energy performance standards that are developed by a variety of standards-setting organizations, such as the Canadian Standards Association.

[20] *Canada Gazette Part II*, Vol. 140, No. 23, November 15, 2006, SOR/DORS/2006/271, Regulatory Impact Assessment Statement, pp. 1817 ff, at canadagazette.gc.ca/partII/2006/20061115/pdf/g2-14023.pdf.

[21] The energy savings displayed in the graph are intended for illustrative purposes only. Ontario Power Authority and local distribution company program contributions are estimated from the supplement to the 2006 annual report of the Chief Energy Conservation Officer. Ontario Hydro historical information is derived from *1993 Net Load Impact of Energy Management Programs*, May 1994. Energy savings are estimated by converting the reported demand reductions using a uniform load factor of 0.3. Savings from load shifting are not included in the graph. Savings from energy-efficiency initiatives are assumed to decline to zero after 15 years. Savings from codes and standards include estimates of energy savings from Ontario's *Energy Efficiency Act* and Building Code. Savings from energy-efficiency standards are derived from Ministry of Energy data. Savings from the Building Code are derived from the energy-efficiency provisions included in amendments to the code made in the 1990s.

[22] In addition to enhanced energy-efficiency standards, Ontario's Building Code contains provisions promoting the use of green technologies such as solar photovoltaic systems, gas-fired emergency generators that can contribute to the power grid, active solar hot water systems, wastewater heat recovery systems and motion sensors for lighting. The code also clarifies that wind turbines are subject to its requirements.

[23] Qualitative and quantitative market research conducted by Ipsos Camelford Graham for the Ontario Power Authority in February 2007.

[24] These results are based on Harris/Decima Polling Results available at www.powerauthority.on.ca, in the Conservation/OPA Market Research section.

[25] Focus groups conducted by Harris/Decima in March 2007 for the Ontario Power Authority.

[26] Telephone surveys conducted by Paul D. Allen & Associates in January 2007 for the Ontario Power Authority prior to the campaign and again in June 2007 following the campaign.

CHAPTER 5

[27] Ontario Power Authority's 2008 Business Plan, submitted to the Minister of Energy on October 1, 2007.

[28] In Canada, building regulation is the responsibility of provincial and territorial governments. The Model National Energy Code of Canada for Buildings sets out cost-effective minimum requirements for energy efficiency in new buildings. Last updated in 1997, it is in the form of a model code to permit adoption by the appropriate authority. To date, no province or territory has adopted the code, but a few, including Ontario, have referenced the code in their building codes and enforce its requirements. For more information, see www.nationalcodes.ca/mnecb/index_e.shtml.

CHAPTER 6

[29] The Demand Side Management Working Group Subcommittee on Building and Housing Energy Labelling.

[30] The Ontario Power Authority consulted with interval meter customers in July 2007, giving them the opportunity to discuss their views on barriers to energy efficiency. The report from the session, *Stakeholder Session on Energy Efficiency Barriers: Ontario's "Interval Meter" View on Energy Efficiency Barriers*, Energy@Work, August 2007, is available on the Conservation Bureau website.

[31] In the *Modeling and Scenario Documentation*, Draft Report prepared by M.K. Jaccard and Associates Inc. for the Ontario Power Authority dated September 6, 2006, 45 percent of savings by 2025 are attributed to pricing tools. See www.powerauthority.on.ca/storage/30/2536_B-1-1_Att_1_Jaccard_Report.pdf.

CHAPTER 7

[32] See www.energy.gov.on.ca/index.cfm?fuseaction=conservation.targets

ENVIRONMENTAL SAVINGS

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1,098 kilograms of air emissions

71 cubic metres of natural gas

Taking
Action

About the Ontario Power Authority

The Ontario Power Authority was established pursuant to 2004 amendments to the *The Electricity Act, 1998*, and began operations in January 2005. It is a not-for-profit corporation without share capital and is governed by an independent Board of Directors, with its activities and programs directed by a Chief Executive Officer. It reports to the Ontario Legislative Assembly through the Minister of Energy and is licensed and regulated by the Ontario Energy Board.

The Ontario Power Authority contributes to the development of a reliable and sustainable electricity system. In doing so, it encourages and facilitates conservation and adequate electricity supply from diverse resources.

More information is available at www.powerauthority.on.ca.

About the Chief Energy Conservation Officer

The position of the Chief Energy Conservation Officer was created by *The Electricity Restructuring Act, 2004*, to provide leadership for the planning and coordination of conservation in Ontario. The focus of the office is on promoting a culture of conservation through building awareness; advocating for improvements in regulations, codes and standards to promote energy efficiency; and reporting on conservation progress. The Chief Energy Conservation Officer heads the Conservation Bureau, which is a division of the Ontario Power Authority.

More information is available at www.conservationbureau.on.ca.

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Ontario Conservation at a Glance

- The Chief Energy Conservation Officer has identified barriers to conservation and made 12 recommendations for action to achieve Ontario's conservation goals. Eleven recommended actions are directed to the provincial government, and one calls for municipal governments across the province to appoint Municipal Energy Conservation Officers.

- Electricity savings from changes to Ontario's Building Code and appliance standards represented about two-thirds of total savings in 2006 and are expected to increase over time.

- The Ontario Power Authority has 18 conservation programs in the market, delivered by a range of partners, with an additional three in development, and expects to have 27 programs in 2008.

- The Chief Energy Conservation Officer expects that Ontario will meet the peak demand reduction target of 1,350 megawatts by 2007.

- Electricity consumption in the Ontario government's own facilities has been reduced by 12 percent, surpassing the goal of a 10 percent reduction.

- More than 800,000 smart meters have been installed on Ontario homes and small businesses.

- Ontario consumers have reduced their electricity consumption by about 5.2 percent per capita, weather-adjusted, during the period January to June 2007, compared to 2005.

- On Aug. 2, 2007, the hottest day of the year, the peak demand was 25,584 megawatts, when the expected peak was 26,302 megawatts.

- The highest peak demand in 2007 was 25,737 megawatts (24,820 megawatts weather-adjusted), on June 26, 2007. This peak is 1,268 megawatts lower than the highest peak demand in 2006 and represents a decrease of almost five percent.

For the environmental savings from the printing of this report, see page 56.

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